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# DEVELOPMENT DIGEST

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Editor, DEVELOPMENT DIGEST  
National Planning Association  
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DEVELOPMENT DIGEST

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Volume IV - Number 2

July 1966

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A journal of  
selected excerpts, summaries and  
reprints of current materials on  
economic and social development

Prepared by the NATIONAL PLANNING ASSOCIATION  
William I. Jones, DIGEST Editor

for

AGENCY FOR INTERNATIONAL DEVELOPMENT  
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Washington, D. C. 20523





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DEVELOPMENT DIGEST

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Volume IV - Number 2

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CONTENTS

PLANNING THE TRANSPORT SECTOR: ROAD BUILDING

|   |    |
|---|----|
| INTRODUCTION  | 1  |
| TRANSPORT AND DEVELOPMENT:<br>GENERAL CONSIDERATIONS<br>George W. Wilson, Barbara R. Bergmann,<br>Leon V. Hirsch, and Martin S. Klein         | 2  |
| ROAD TRANSPORTATION<br>AND FOOD PRODUCTION<br>Wilfred Owen  | 8  |
| NEW ROADS AND DEVELOPMENT:<br>THE EVIDENCE FROM CASE STUDIES<br>George W. Wilson, Barbara R. Bergmann,<br>Leon V. Hirsch, and Martin S. Klein | 13 |
| ROAD BUILDING AND ECONOMIC<br>DEVELOPMENT IN SABAH<br>R. S. P. Bonney   | 21 |
| ECONOMIC EFFECTS OF<br>THE FRIENDSHIP HIGHWAY<br>Wisit Kasiraksa  | 34 |
| A RECENT WORK ON TRANSPORT<br>PROJECT PREPARATION AND<br>APPRAISAL; A REVIEW  | 39 |

## THE GOVERNMENT BUDGET AND PLANNING

|  |    |
|--|----|
| ANNUAL BUDGET AND PLAN IMPLEMENTATION<br>William I. Abraham                                    | 41 |
| PROGRAM AND PERFORMANCE BUDGETING<br>Albert Waterston  | 51 |
| THE RELATIONSHIP BETWEEN ECONOMIC<br>DEVELOPMENT PLANNING AND BUDGETING<br>Faustino Sy-Changco | 56 |

## DISGUISED UNEMPLOYMENT?

|   |    |
|---|----|
| DISGUISED UNEMPLOYMENT IN<br>AGRICULTURE: A SURVEY<br>Charles H. C. Kao, Kurt R. Anschel,<br>and Carl K. Eicher | 65 |
| SURPLUS AGRICULTURAL LABOR AND<br>DEVELOPMENT: FACTS AND THEORIES<br>Morton Paglin                              | 71 |
| UNDEREMPLOYMENT AND DEVELOPMENT<br>IN DUAL ECONOMIES: TESTING<br>ALTERNATIVE THEORIES<br>Dale W. Jorgenson      | 83 |
| SOME SOURCES ON UNDEREMPLOYMENT<br>IN AGRICULTURE   | 92 |

## STIMULATING ENTREPRENEURSHIP FOR SMALL INDUSTRY

|   |     |
|---|-----|
| INTRODUCTION  | 95  |
| DEVELOPMENT OF<br>SMALL INDUSTRY PROGRAMMES<br>Eugene Staley      | 96  |
| PUBLIC POLICIES TO ENCOURAGE<br>SMALL INDUSTRY IN ASIA            | 111 |
| ACHIEVEMENT MOTIVATION<br>CAN BE DEVELOPED<br>David C. McClelland | 115 |
| <hr/>   |     |
| GETTING AGRICULTURE MOVING:<br>THREE BOOKS                        | 125 |

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 f  
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 n  
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## PLANNING THE TRANSPORT SECTOR: ROAD BUILDING

Expenditures on transportation, both capital and current, form a large part of the budgets of almost all less developed countries. This situation reflects the conviction that transportation is an important key to development; to the marketing of local manufactured goods, to raising agricultural yields in densely populated regions, to stimulating new agriculture in sparsely populated ones. While this conviction is shared by almost everyone in the development field, little research has been done to determine the costs and benefits from road building (the largest component of transport expenditures) or to guide planners in choosing between roads and alternative projects.

Two major projects dominate the work being done to fill these gaps. The British Government's Road Research Laboratory has been conducting studies of costs and benefits of roads in tropical countries since 1958 and publishing technical material since 1943. The Brookings Institution's Transport Research Program, financed by the U. S. Agency for International Development, not only conducts similar studies, but also evaluates the effects of other means of transportation, and the criteria for choice within the transport sector and between it and other sectors.

In this section, two sets of excerpts from a Brookings publication spell out the general relationship between road building and development, and analyze the lessons learned from case studies of new roads and development. Wilfred OWEN, Director of the Brookings project, considers the interrelationships linking road building and increasing food production. Finally, we summarize two case studies of development roads, one on Sabah by R. S. P. BONNEY of the Road Research Laboratory, and the other on a road in Thailand by Wisit KASIRAKSA.

## TRANSPORT AND DEVELOPMENT: GENERAL CONSIDERATIONS

George W. Wilson, Barbara R. Bergmann,  
Leon V. Hirsch, and Martin S. Klein

[ Adapted from The Impact of Highway Investment  
on Development, Washington (D. C.), Brookings  
Institution, 1966, US\$ 6.00, 226 pp. ]

Adapted from  
a part of the  
book.

Finding effective techniques for accelerating economic growth in underdeveloped nations is a complex endeavor. After almost 20 years, a satisfactory understanding of the development process seems to be as elusive as ever. Most analyses of growth still focus on the need to raise the proportion of national product devoted to capital formation. If there is any relationship between capital formation and economic growth, there must be some relationship between an important component of capital formation and growth. Indeed, the composition of the aggregate may be more significant than its magnitude. Thus, attention to any one of a variety of components of capital might be profitable.

One reason for singling out the transportation sector is its relative importance in virtually all countries. Since transport is an important absorber of scarce resources, ill-timed, misdirected, or misplaced transport investment can have a serious impact upon the whole economy. This is especially the case

George W. Wilson is Chairman of the Department of Economics of the University of Indiana, Bloomington. Barbara R. Bergmann is Professor of Economics at the University of Maryland, College Park. Leon V. Hirsch and Martin S. Klein are members of the staff of United Research Inc., Washington (D. C.).

since much investment in transport is large, indivisible, and long lasting; hence, it can tie up vast amounts of resources for long periods of time.

A more important reason for stressing the role of transportation is the frequent assertion that, at least in the early stages of development, it is the key sector. Indeed, these views regarding its significance are one reason why transport investment forms such a large part of total investment. They are reinforced by the fact that a transport base was created prior to, or coincident with, rapid growth in Western industrial nations. Ever since Adam Smith argued that the "division of labor is limited by the extent of the market," people have stressed this sequence: improved transport extends the market, which increases the division of labor (specialization), which raises productivity. In their enthusiasm for abridging distance, policy makers seldom realize that the relationship of transport to this sequence is partial and indirect.

It is partial because there are two senses in which "extent of the market" may be construed -- a spatial meaning, to which transport obviously applies, or a purchasing-power sense, which does not necessarily involve a widening of geographical horizons. The extent of the market for any product depends upon much more than general purchasing power of any geographical region. It is also a function of price, quality, the nature of the commodity, sales effort, tastes, and preferences -- none of which are necessarily tied to the capacity to move the product. The sequential relationship between transportation and growth may, in fact, be broken at many points.

The whole emphasis on transport as a strategic sector is reinforced by two other interrelated factors: 1) the observed correlations between rising gross national product per head and some index of mobility, and 2) the many noneconomic roles ascribed to transportation -- national cohesion, political and social unity, and military and logistic needs. Even where considerable doubt attaches to the economic value of new transport capacity, the noneconomic roles can overwhelm the dubious economics.

It is generally agreed that adequate transportation is an important precondition for growth. Yet there are many illustrations of abundant transport but still a lack of economic dynamism. Some degree of capacity for movement of goods, people, and resources is necessary for growth, but it may be questioned whether any given degree of capacity is sufficient. Therefore, it is necessary to examine those other circumstances of sufficiency -- those necessary clusters of change which serve to explain the varying results from large transport investments in particular instances.

## Transport Reduces Costs

An improvement in transport capacity permits faster, safer, cheaper, and more dependable service which, in turn, allows a greater movement of goods and people per unit of time. Each of these service dimensions of transportation has a somewhat different impact upon mobility and economic growth.

Speed permits more intensive use of existing transportation facilities, which is capital-saving in two senses. 1) Less needs to be invested in transport to provide the same amount of service, assuming that depreciation does not rise in proportion to use per time period. In fact, total depreciation may even decline if the improved facility, such as a good road surface, leads to less wear and tear on the conveyances. 2) Producers may retain smaller inventories so that a greater amount and variety of real investment is possible.

Safety has both a cost and a psychological dimension. Improvement in safety tends to stimulate use and to reduce the hazards of movement. This brings about greater utilization of the facility per time period and reduced costs in the form of damage, loss, or insurance.

Cost refers to the reduced inputs required to move any given quantity of goods or number of people between two points. These released inputs become available for other purposes, permitting greater total output from the same factors of production. The surplus product so generated may accrue in pecuniary form to producers (if freight rates are reduced in proportion to the cost reduction), to the providers of transport service (if rates remain the same), or to both, depending upon the degree of competition in the transportation and goods markets. In the longer run, the gains may accrue to consumers of the product, again depending on the degree of competition in the relevant market. The disposition of these pecuniary gains will condition subsequent secondary effects and may range all the way from increased leisure through increased consumption to greater investment in productive facilities.

Dependability allows producers to schedule operations more efficiently. This implies reduced costs in the nontransport sector. The potential secondary effects are comparable to, but probably less extensive than, those mentioned above.

In general, improved transport in any of the four service dimensions leads to a reduction in the total resources required to produce and distribute a given volume and pattern of output per time period. It increases the incomes of producers, consumers, or those who provide transportation service. How released resources are subsequently used will determine the crucial secondary effects which ultimately induce changes in the magnitude and composition of output.



It is usually assumed that there exists an enterprising, rationalistic environment in which certain entrepreneurs actively seek pecuniary advantage and, hence, respond positively to decreasing costs which emerge through improved transportation. Furthermore, some of the surplus receipts which accrue as a result of cost decrease are employed productively. They end up in business or businesslike hands either directly in the form of excess profits or indirectly -- from the increase in household savings made possible by lower prices -- through a banking system, security exchange, or other financial intermediary.

This description implies: 1) a prior dynamism obviously held back by a transportation bottleneck, and 2) a set of institutions which are modern as distinguished from traditional. Neither of these is applicable to most underdeveloped regions. Noneconomic or institutional factors make the impact of improved transportation uncertain. Even assuming "economic man" and an economically propitious environment, there must be adequate investment opportunities which permit exploitation of available raw materials and other resources.

#### Transport Investment Prone to Misallocation?

Investment of scarce resources in transport capacity may be misdirected. It may be less productive than some alternative opportunity and may keep the growth rate below what it would have been with more efficient use of resources.

Clearly, mistakes in allocating resources can occur in any sector. Cost-benefit analysis, even when properly carried out, is still loaded with subjective evaluations regarding such things as what price to put on those benefits normally not marketed, the appropriate rate of discount, and so on. This means that errors are inevitable -- that some other allocation would have yielded better results -- although this could not have been foreseen. Mistakes may be made in the prior estimate of maintenance or other operating costs of assets actually constructed, but this applies to any sector of the economy. Yet various economists have argued that it is especially liable to happen in the transportation sector for two reasons.

First, the lumpiness, specificity, longevity, and externalities associated with much transportation capital create greater hazards in calculating and specifying future benefits and costs. This makes decisions to invest in transport not as easily reversible nor as readily corrected as with assets that wear out rapidly or that can be built in small increments.

Second, there is a belief that transport is a "safe" investment in the political sense. For example, Albert O. Hirschman asserts that "perhaps it is this absence of criteria and of sanctions that has

endeared...[social overhead capital] so much to the developers. Development planning is a risky business and there is naturally an attraction in undertaking ventures that cannot be proven wrong before they are started and that are unlikely ever to become obvious failures."

These two factors suggest that the probability of misallocating scarce resources is especially acute in transport. With regard to the first, it may be granted that some (but not all) forms of transportation investment are lumpy, indivisible, and durable, but surely this is not a fundamental difference from investment in, say, a steel mill or a power facility. Attempts are seldom made to specify in what sense the transport industry is unique and, in those few instances where this is attempted, it is customary to list a series of items which relate as well to a good many other industries. Everett E. Hagen argues that even railways can be expanded in bits and pieces and cites Colombia as an example.

The assumption that transportation is a politically safe investment is also open to serious question. Steel mills, dams, a modern air force, and atomic power plants may be politically safe regardless of their economic benefits, and may well be more symbolic of progress in the eyes of aspiring or even entrenched politicians than a single-track railway or a gravelled road. Transport is more a grubby kind of necessity when not lavishly overdone. Even when overdone, as it frequently is, transport investment is no more politically safe than any other symbol. Nor is it true that cost-benefit analysis is less applicable to even an expensive, long-lived piece of transportation capital than it is to a major investment in housing, education, or health.

#### Arguments Against Transport

An increase in transport capacity may actually lead to a decline in output per head. The simple protectionist argument suggests that the tender bud of initial industrialization in any area requires the protection of high transport costs as a shield against low-cost competition from other nations. Furthermore, it is argued that improved transport may have a detrimental impact on one segment of the economy, creating regional disparities.

High transport costs work both ways. While they protect local producers, they disadvantage industries where economies of scale might exist, and they reduce the net receipts from export trade which are so important for most underdeveloped countries. With regard to regional disparities, long before they grow to such an extent that further growth of the entire nation is jeopardized, deliberate policies to correct the situation will come into play.

## Obstacles to Mobility

There is a growing skepticism in some quarters regarding the potential of transport for accelerating growth, and there have been some recent attempts to reinterpret history to show that transport followed, rather than preceded, economic dynamism; or that its role in the growth process has been overstressed. This is perhaps a healthy reaction to some of the excessive claims made for transport.

Still, if it is agreed that adequate transport capacity is not by itself a sufficient condition for accelerating the growth rate, some insight might be gained into the relationship between transport and growth by examining the factors that impede mobility, even in the presence of adequate capacity. In general, mobility between any two points or regions requires a demand in one area and a supply in the other. These, in turn, imply the existence of a market and an excess supply above consumption needs in the respective areas.

In addition, the cost of movement must not be so high as to reduce or eliminate the potential for profitable exchange. Thus, some reasons for restricted mobility are: subsistence production, the absence of recognized markets, transport costs which are too high relative to market values to make increased production profitable, excessive delays or risks in transportation which either adversely affect the value of the product or are too burdensome to warrant the trouble. These reasons for restricted mobility are interrelated -- any one of them can thwart increased production -- but only one of them relates directly to transportation capacity. To induce use of a transport facility requires a simultaneous stimulus to organize markets more effectively, transmit market information, establish credit facilities, and so on.

Since development, in its strict economic sense, requires increased specialization, it entails increased interdependence and a breaking down of islands of self-sufficiency. In turn, this means an increase in mobility. More people and goods must be moved, usually over longer average distances, because the number of market centers tends to decline (once development has proceeded for some time), although each handles greater volumes of business. Both the number of tons shipped and miles travelled tend to rise as the units of self-sufficiency break down and become ever more closely linked to market processes. The social and economic changes which result may be resisted to such an extent that effective mobility is restricted.

In general, it is clear that the obstacles to mobility are virtually coextensive with the obstacles to development. Thus, the analysis of specific cases relating to the utilization of new or improved transport facilities should also prove relevant to the broader and more significant issues of overall economic growth and development.

## ROAD TRANSPORTATION AND FOOD PRODUCTION

Wilfred Owen

[ From a paper presented at the 45th Annual Meeting of the Highway Research Board, Washington (D. C. ), January 1966. The paper will be published in full in Highway Research Record, Number 125, 1966. ]

This is a summary of the paper.

Population projections to the year 2000 indicate that the number of people to be fed will be roughly double what it is today. The United Nations estimates that by 1980 annual food grain requirements of the developing countries alone will be 767 million tons, compared to 470 million in 1960. The added burden on transportation facilities will be disproportionately heavy. Increasing urbanization, especially in developing countries, will require that more food be moved from farm to city. The proportion of farm output that is marketed will have to rise. As incomes rise, as it is hoped they will, food purchases will shift from staples to a more varied diet, including dairy products, meat, fresh fruits, and vegetables. These perishables demand high-quality transportation.

### Inputs Needed for Higher Yields

When food output is raised by expanding the cultivated area, the inputs used are generally small. However, in many areas, it is no longer possible to produce more food simply by expanding the area under cultivation. India, China, and Pakistan, with 60 percent of the population of the underdeveloped world,

Wilfred Owen is Director of the Transport Research Program of the Brookings Institution, Washington (D. C. ).

are now almost entirely dependent on increasing yields per acre for additional food output. Increasing yields requires heavy inputs, especially fertilizer, but also seed, machinery, and other ingredients of intensive agriculture. Farmers must move their surplus output to market. All this presupposes improved systems of transport.

While many factors contribute to higher agricultural yields, including improved seed, insect and disease control, irrigation, drainage, and mechanization, the use of commercial fertilizer is probably the factor most responsible. Yields in developing countries have not increased by very much as yet. From the late 1930s to 1960, in Asia and Latin America the increase was only 10 percent, compared to 190 percent in North America. However, from 1952-53 to 1960-61, fertilizer consumption in Latin America increased 163 percent and in the Far East by 115 percent. The move toward greater use of fertilizers is illustrated by India's Fourth Plan. India's fertilizer consumption is now extremely low -- 1 percent of the level in Japan -- but, during the Plan period, it is to increase from two-thirds of a million tons per year to two million, a 24 percent annual increase. A 167 percent increase in pesticides, weedicides, and rodent controls; the use of sprayers and dusters; and the expansion of local industry are expected to add further to transport needs.

Obviously the effects of fertilizer can be realized, as an FAO report recently stated, "... only if adequate facilities make it possible that fertilizers reach the cultivator at the right time." This means roads, vehicles, and a network of distribution centers in rural areas within easy reach of farmers.

#### The Relation of Roads to Production

The transport implications of improving agricultural yields can be seen in the relationship between road density and agricultural progress. In Britain, France, Japan, and the United States there are around four miles of farm-to-market roads per square mile of cultivated land. In Taiwan and Denmark the number is closer to three. In India, there are only about two-thirds of a mile of road to a square mile of cultivated land; in Malaya, about three-fourths and; in the Philippines, around one. A certain minimum density of farm-to-market roads is clearly present where rural development has achieved high levels, and none of the poor countries has nearly enough.

In India, farmers using modern technology are nearly all within a mile and a half of some sort of reasonably good road; very few farmers further than this are using modern methods. Since three-fourths of the villages of India are more than that distance from a road, it appears that, under present access conditions, any hope of raising productivity in Indian agriculture may be limited to the other one-fourth. Without



discounting the many other factors involved in persuading villagers to use modern methods, it appears that, without improved roads, most agricultural development efforts will not succeed. India's rural areas are virtually isolated from the rest of the economy; neither farm supplies nor new ideas can move to where they are needed.

One attempt to overcome the rural development problem is the intensive agricultural district program. This "package program" concentrates agricultural inputs in certain areas having promising potentials. As could be expected, the areas where this approach has been most successful are those that are more accessible. In Ludhiana District of the Punjab, there have been marked increases in wheat production per acre where access by road has made the program operable. After three years, yield per acre has increased 40 percent, total output 68 percent, and consumption of chemical fertilizers has grown from 5,500 tons to 24,000 tons. Farmers in Ludhiana District were getting an additional return of 126 rupees per acre for an added cost of 54 rupees.

In areas where transportation is poor, however, supply problems have limited the effectiveness of the package program. Despite the variety of assistance available, lack of transport has inhibited the program. Vegetables and other perishables cannot be grown since transport must be quick and reliable to enable producers to move their product. On a poor road, the trip to market, if possible, may be too hard on bullocks if they are also to plow and cultivate. The milk collector, on his bicycle is able to carry at least twice as much milk on a good road, and therefore avoids farmers with poor access. Farmers on bad roads are unable to specialize since each grower must keep his family supplied with a variety of food because he knows it will be difficult to obtain deliveries from other sources. Plant protection measures and fertilizing are difficult due to infrequent and unreliable delivery. Few high school-aged children are able to get to school. Literacy and extension workers find it either impossible or too time-consuming to visit farmers on muddy roads.

In East Pakistan, a rural works program was undertaken several years ago to remedy some of the conditions that made agricultural yields among the lowest in the world. [See Development Digest, Vol. III, No. 2, July 1965, pp. 19-30.] The situation was not the kind that one would expect a road-building program to cure -- densely populated, low-lying land is subject to frequent flooding and has an intricate river system. However, the program has shown how roads plus other measures can create successful agriculture. New roads were selected for labor-intensive construction by villagers. They were of low-type design, adequate for rickshaw and bullock carts. The result was an 80 percent reduction in transport costs. The program has now been greatly expanded, and from 1961 to 1964, 24,000 miles of village-to-market roads and 700 miles of asphalt roads were completed.

## Vehicles for the Roads

For local transport, the substitution of farm trucks for bullock carts and other nonmechanized forms of transport will be hastened by better roads and increasing mechanization of agriculture. While animals have the reputation of furnishing low-cost transportation, for most types of work this is an illusion. In India, the bullock averages 1.5 miles per hour with a load of 1.5 to 3 tons. Costs range from 22 to 44 cents per ton-mile. The introduction of tube wells, mechanical threshers, and tractors will encourage the shift to motor transport, since the economic justification of bullock transport rests on other, non-transport duties such as water pumping, millet thrashing, and plowing.

Adequate long-distance transport facilities from local marketing centers to urban consuming centers are equally important. Indian agriculture has become increasingly dependent on over-the-road transport for marketing of perishables. On the Delhi-Bombay route, for example, the largest single class of freight is fruits and vegetables. Remarkably, this growth has taken place despite every kind of obstacle: poor roads, inadequate terminals, the high price of vehicles, and police harassment at local tax barriers. The evidence illustrates how desirable truck transport has become even where service is extremely poor.

In Ghana, food marketing has been greatly enhanced by the advent of trucking. A recent survey showed that 55 percent of the food destined for Accra was moving over 50 miles. A high degree of specialization has also developed; none of the regions supplying Accra shipped any appreciable volume of more than one commodity.

## Other Aspects of Development

Better education, health, and a wide variety of innovations are also important for rural development. The contribution of transportation to these other factors is illustrated by the case of the 20-mile Ramnad-Mandapam road in Madras. Formerly the towns were joined by rail and a narrow path. When the road opened, two bus companies began operations. Milling and pottery industries expanded, as did the fishing industry. Many retail shops were opened. The trend in prices indicates a steady decrease in geographical price differentials, and the new road has helped bring village prices more in line with those prevailing in the Ramnad market. There has been an increase in elementary schools; three new post offices are operating. This situation has been duplicated in many parts of India and Pakistan.

## Planning Transportation for Food

A successful strategy for rural transport planning might best aim at increased food production and marketing. If the resources available

to improve agriculture are to be employed to maximum advantage, it will be necessary to weigh the merits of various combinations of inputs. It will generally be necessary to build some type of road to provide the necessary minimum standard of transportation. However, decision makers cannot afford to overemphasize transportation and neglect fertilizers; they cannot afford to concentrate on roads to the exclusion of vehicles; they cannot neglect storage and processing solutions that might make for a more successful agricultural program than transport solutions alone; they cannot neglect the role to be played by cooperative organizations and local governments.

It is clear that the time of transport planning in isolation has passed. The closest collaboration of transport and agriculture ministries, and the establishment of broadly conceived agricultural development agencies at the local level will be required. Thus, it may be possible to come closer to an optimal use of resources than has been achieved in the past. For instance, with the help of a computer, it is now possible to simulate inward and outward flows of traffic and to test the effectiveness of various transport and non-transport methods of handling these flows. The availability of such new techniques can help developing nations to view transportation planning as part of the whole process of assuring enough food for sustained economic growth.



NEW ROADS AND DEVELOPMENT:  
THE EVIDENCE FROM CASE STUDIES

George W. Wilson, Barbara R. Bergmann,  
Leon V. Hirsch, and Martin S. Klein

[ Adapted from The Impact of Highway Investment  
on Development, Washington (D. C.), Brookings  
Institution, 1966, US\$ 6.00, 226 pp. ]

[ This book compares evidence gathered in the most significant case studies of new roads to determine the impact of their construction on economic development. New case studies have been undertaken as part of the Brookings program, and existing ones have been analyzed. The cases covered in this volume are in Bolivia (Cochabamba-Santa Cruz Highway), El Salvador (Seashore Highway), Guatemala (Atlantic Highway), India (Ramnad-Mandapam Road in Madras), Nicaragua (Seashore Highway), Peru (Eastern Andes), Malaysia (Sabah), Thailand (East-West Highway and Friendship Highway), Uganda (West Nile Province), and Venezuela (Caracas-Valencia Highway). The conclusions which emerge from this review are presented here. ]

Adapted  
from a part  
of the book.

The cases confirm the belief that additional capital, whatever its form, may be a necessary, but not a sufficient, condition to induce economic growth. In every instance, even where rapid development ensued, it was a combination of circumstances which, in conjunction with the highway or road, occasioned the growth of output.

In some instances, the road was a response to population pressure or higher prices which would have brought new lands and crops into production even without the road, although possibly not to the same extent. In these cases, the road accelerated

an existing trend, but can scarcely be deemed causal. For example, in Sabah (formerly North Borneo) and Uganda, the population increase induced the taking up of new land and there is no doubt that, whether easy access were provided or not, such expansion would have ensued. Rising prices for cotton and rubber accentuated this trend. The observed relationship between roads and production in Uganda does not imply that the roads were the cause of greater production. In fact, the opposite is more nearly the truth.

The same is only slightly less true in Nicaragua and El Salvador. In the region affected by the Pacific Seashore Highway in Nicaragua, the area planted in cotton and total output were both increasing well before the highway was completed. This trend would doubtless have continued without it, because cotton prices increased in recent years and more efficient production techniques were adopted. In these two cases, transport, instead of being a necessary precondition to take-off or even a leading sector, was a response to pressures generated both from without (rising commodity prices) and from within (growing population).

Bolivia is somewhat different, despite population pressure in the highlands. New lands were not easily settled; hence, the population pressure built up a need for new lands that could not be satisfied in the highland area, and mobility out of the region was stifled by physical and perhaps psychological barriers. A kind of pent-up demand arose to which the highway was one form of response. But, unlike the other cases mentioned, this response was to latent demands which would otherwise have been frustrated. In this sense, the Bolivian road has more causal implications with respect to actual or potential development.

In other instances, the prevalence of easily exploitable natural resources was a necessary adjunct to whatever degree of success followed the completion of the highway. For example, the East-West Highway in Thailand served to open up the lush Pasak Valley, especially to timber production. The Friendship Highway also passes through a region most of which is suitable for agriculture, as the sharp increases in output testify. In the Western Montaña of Central Peru, the close relationship of lumbering to road access is significant. We have already noted the suitability of the soil in Uganda, Sabah, and Nicaragua, without which little use of the highway would have ensued. The relative failure of the Guatemalan road (and to a lesser extent the Cochabamba-Santa Cruz Highway in Bolivia) to generate much new traffic is, in large part, attributed to the dearth of natural resources along the road.

In many cases, such as Bolivia, Guatemala, Peru, India, and the two areas in Thailand, whatever development there was would not have occurred, and certainly not in its present location, without the highway. The highway, along with other investments, policies, and natural

resources did not merely facilitate a line of development that would have unfolded anyway. It was part of an initiating cluster of change and deserves recognition as one of the causal agents. But the existence of readily exploitable resources, even if they could be developed by using available skills and equipment, is not enough.

There is a more basic prerequisite for development, namely, a willingness and ability to identify and exploit a new economic opportunity. The search for a single source of economic growth, for a particular catalyst that will work in every instance, is doomed to failure. What is needed is not merely a higher rate of savings and investment, or the creation of a class of entrepreneurs, or improved labor quality or political stability or "adequate" infrastructure taken separately. It is all these things and more besides.

At particular stages of growth and under a given set of circumstances, one particular policy or investment may emerge as seemingly more crucial than others under the given conditions. Transport may be a serious bottleneck at one time; its payoff then becomes as great as it is obvious (as in the Venezuelan case). This does not mean that, for the economy as a whole, considering all investment options, the decision to construct the autopista from Caracas to Valencia was the best one. But even in this case, the actual payoff is a result of all those factors causing the bottleneck to appear as well as the enlarged transport capacity designed to relieve it.

A much more skeptical attitude toward transport appears essential, and far more attention must be devoted to the set of circumstances surrounding the expansion of transport capacity. The cases in the present volume illustrate this point, despite the fact that most of them appear to be "successes" in one way or another.

Each case, though different in many respects, is not unique. The following discussion of what the cases show is designed to narrow down the apparent variations among them and indicate the path toward some meaningful generalizations.

#### What the Cases Show

Traffic. In every case there was a rise in traffic volumes along the new facility which, in most instances, represented a net increase in total mobility, not merely a diversion. Where no previous connection existed, the traffic on the highway represented a net increase in movement. But in most instances, even where rail connections were paralleled, the rise in highway movement implied a net increase.

In general, the extent of diversion from parallel facilities, other than indigenous forms of transport such as oxcarts, was not significant

compared to the growth along the new facility. Even where diversion occurred, this proved to be a more rational allocation of traffic.

In every case, local traffic was almost completely captured by truck transport except for heavy, bulky, low-valued commodities such as bricks, tiles, gravel, timber, etc., which continue to move by rail where this is a possible alternative. Longer-haul or through traffic also showed a shift to truck from rail but, for the most part, this represented movement of the increased production in the region, and the extent of diversion from alternative forms of transport was relatively small. Passenger traffic, however, shifted more dramatically to bus service once the road was completed.

Production. The net increase in mobility implied an increase in both the tonnage of freight and number of people moved during any time period and, in some instances, a lengthening of the average distance traveled. As both cause and consequence of this, a sharp rise in production (mostly agricultural) took place with a growing emphasis on production for the market rather than for subsistence. In other words, the rise in mobility was not simply more movement over longer distances of existing annual volumes of production. In virtually every case, the greater mobility represented a net increase in physical output as well as a higher value of output per unit of weight as substitutions for both low-valued cash crops and subsistence crops ensued. The extent of growth of new output was particularly striking in the area affected by the Thai Friendship Highway, and the Nicaragua and El Salvador Seashore Highways. In the Department of Chinandega, Nicaragua, the area cultivated increased by over 70 percent as much pastureland was converted to crops, while the estimated value of output almost tripled between 1951-52 and 1962-63. The sharp rise in value per unit of cultivated land is attributable to a substantial shift from low-valued crops to cotton and sugarcane as well as rising yields, especially in cotton.

Even in Guatemala, where the area affected by the road was not extensive and conditions along the right-of-way were not propitious, some net increase in cash-crop production for sale in Guatemala City was reported, and this implied a substitution for subsistence crops.

The most dramatic change occurred in El Salvador where cotton output increased more than seven times in the decade following 1953-54. Indeed, the conversion of a relatively substantial region from subsistence to market-oriented production probably went further in El Salvador than in any other region examined.

Timber production increased sharply following completion of penetrating transport facilities in Peru and the Pasak Valley in Thailand. Slightly less dramatic were the production increases in the Ramnad-Mandapam area of India, Sabah, Uganda, and the Aragua Valley in

Venezuela. Only the Guatemalan road and Cochabamba-Santa Cruz Highway in Bolivia have failed to trigger much new production along their paths. Most of the increases in output constituted a net growth for the economy as a whole and did not simply represent a relocation of productive activity.

The substitution of cash for subsistence crops was especially apparent in Sabah, El Salvador, Nicaragua, Thailand, and the Western Montaña in Peru. In the Santa Cruz area of Bolivia, substantial new cash-crop production arose as a result of new settlement. This implies not only a greater volume of output but a higher unit and total value as well. More importantly, it permits greater specialization and provides an essential integration of market-oriented economic activity over a more extensive area.

In most instances the transport facility served directly or indirectly to bring more land into productive use, although the extent of this varied widely. It was obviously dependent upon the type and length of road as well as the quality of the soils or forests through which the road went or to which it provided easier access. Yet, in the cases studied, there was no relationship between the cost of the highway per mile and the developmental impact.

Excluding the Caracas-Valencia Highway in Venezuela, which is a very special case, the most expensive was the Guatemala road, which cost over \$260,000 per mile. The East-West Highway in Thailand cost about \$210,000 per mile, and the others in Latin America cost between \$100,000 and \$150,000 per mile. The Ramnad-Mandapam road and the unpaved roads in Sabah cost less than \$20,000 per mile. There is no relationship between these amounts and traffic estimates several years later, which varied from less than 150 vehicles per day for the highway in Bolivia and the roads in Sabah and Uganda, to between 400 to 700 on the Guatemalan and East-West Highways, and to almost 1,000 on the Friendship Highway and portions of the coastal highway in El Salvador.

There are many other factors of crucial significance. Indeed, as shown in the Uganda case, when the time of harvest coincides with the dry season or a time of year when dirt roads are passable, all-weather or surfaced facilities are not essential for inducing sustainable increases in output of crops, especially if the crops are not subject to serious damage through rough transport (e.g., cotton). On the other hand, all-weather roads are important where these circumstances do not exist. The only specific example of this is in Sabah, where a positive relationship was shown to exist between all-weather roads and the value of crop production at varying distances from the market. Furthermore, where constant attention must be paid to crops during the growing season, accessibility at all times during the year, and not merely to transport the



harvest from the fields, is important, as the Nicaragua and El Salvador cases suggest.

Rates and service. In every case except that of El Salvador the mechanism that served to stimulate additional output, cultivation of new lands, and more passenger travel was a sharp decrease in freight and passenger charges from levels prevailing prior to the new facility, as well as improved service. This, however, did not happen spontaneously. Rough estimates suggest that rates for most of the commodities involved dropped by about 50 percent in the Guatemalan, Bolivian, and Indian cases and by even more than this on the Thai Friendship and Nicaraguan Pacific Seashore Highways. Data on rates for the other cases are either not available or indicate a mixed pattern.

The greater extent of rate reduction for imports than for exports reflects the typical situation of an underdeveloped country. Bulky, low-unit-value, agricultural commodities predominate among export commodities and high-unit-value manufactured goods constitute the major proportion of total imports. This meant that, before road competition, the rail rate from the ports was significantly higher than the rate to the ports. Furthermore, the import traffic in general is more suited to truck transport than is the export traffic. Thus, the import rate by rail was especially vulnerable to truck competition. It is not surprising that, when road facilities were made available, the prime target was the import traffic.

The even more drastic rate reductions for local traffic were less a result of "excessive" rail rates, where rail transport was an alternative, than of the high cost of indigenous forms of transport and vigorous competition among the large number of independent truckers who suddenly emerged. The marked service advantage of motor transport over rail, especially for short hauls, meant that a substantial diversion from rail to truck could not be prevented. Short-haul truck rates up to 50 percent above the corresponding rail rate did not prevent the loss of local traffic to trucks.

No rate change was possible without the creation of excess capacity in transport and relative freedom to set whatever rates seemed necessary to utilize such capacity. Where some type of restriction on entry into the trucking business was in force (e.g., Guatemala), the results were among the poorest of all the examples given. Again, in the Bolivian case, part of the lack of success, at least during the early years, has been attributed to monopolistic tariffs due to "restrictive practices of the Cochabamba and Santa Cruz road haulers' federations." In other words, one precondition for rate changes was the rise or expansion of entrepreneurial activity in the provision of transport service and an absence of direct or indirect restrictions.

At the same time that rates decreased, the service became faster, and accommodations for small shipments over relatively short distances were improved. Time in transit was sharply reduced compared with previous alternatives in almost all cases. But, of greater importance, especially to local traffic and smallholders, is both the increased flexibility of service and the ability to transport smaller amounts at reduced rates. Average loads with few exceptions run from barely four to ten tons, depending on the country and nature of the vehicle, and these are well below the cut-off points for carload rates by rail. Door-to-door service also eliminates the time and extra cost of transshipment. Furthermore, truck transport is inherently more capable of tailoring service to specific needs, especially of small-scale producers.

Because of the nature of these changes, substantial benefits accrued to smallholders located near the highway relatively close to the market, as well as to middlemen who handle small quantities at any one time. Where the highway paralleled a rail connection, the relative advantage was even greater since there was no need to transship and smaller loads could be moved more efficiently. In all such cases, a more rational traffic allocation ensued. The less-than-carload, short-distance traffic which moved at high rates by rail was captured by the trucks. This permitted, or forced, the railroad to concentrate more on the type of traffic for which it has an "inherent advantage."

The effect, in short, of a net increase in mobility was to bring about an improved utilization of an expanded transport capacity. Both the former users of alternative modes of transport and the new users benefited. At the same time, fewer resources were used up than would otherwise have been the case. More traffic was carried at lower per unit real costs (as well as rates) as a result of the new facility and increase of vehicles.

**Population.** Even in the absence of information concerning regional demographic trends, a positive relationship between new transport capacity and population was evident. This does not imply any relationship at the aggregative level where, in fact, transport would represent more of a response to population growth. For particular regions, transport facilities are both cause and consequence of population growth. When transport creates new economic opportunity, it attracts people to the area. Increases in output usually require more labor; higher incomes attract new settlers; and a demand for services, shops, and other economic activities emerges. So long as markets remain favorable and the resource base undepleted, this process becomes self-reinforcing and the rate of population growth in the region affected is accelerated.

Improvements in health, resettlement schemes, and relative economic potential of particular areas are more significant than access,

regardless of the fact that access of some sort is a necessary condition for effective attacks on disease and resettlement as well as exploitation of economic opportunity. Just as in the case of the growth of production, population responds differently to new transport capacity depending upon a complex of conditions.

### Conclusion

In every case, the extent of new traffic generated depended mainly upon the availability of easily exploitable natural resources. The lowest levels of traffic, omitting the earth roads in Uganda and Sabah for which traffic estimates are lacking, were associated with highways traversing a territory poor in resources. The Guatemalan, Bolivian, and Indian experience typify this situation. The largest traffic volumes or those growing most rapidly involved highways through areas rich in forest reserves or with good soil conditions for cash crops. This was especially true in Nicaragua, El Salvador, Venezuela, Peru, and Thailand. Additional inducements to open up new lands were population pressure, rising prices for the crops concerned, reduced transport charges, and improved service. In short, the highest traffic volumes were fairly consistently associated with rising net receipts to producers of agricultural products. No adequate details of actual or possible prospects were provided, but the inference is clear that they created a powerful inducement to raise output and sell a greater proportion of it in local, sectional, or world markets.



## ROAD BUILDING AND ECONOMIC DEVELOPMENT IN SABAH

R. S. P. Bonney

[ From "The Relationships Between Road Building and Economic and Social Development in Sabah," Department of Scientific and Industrial Research, Road Research Laboratory, Ministry of Transport, West Drayton (Middlesex), England, February and July 1964, 3 parts, 23, 9, and 15 pp., plus tables; single copies available upon request. ]

These are  
excerpts  
from the  
report.

Most less developed countries have insufficient transport facilities to make efficient use of their material and human resources for economic and social progress. In order to remedy this position, considerable emphasis is being placed on the provision of transport, particularly by road. The fact that these countries are generally short of investment funds makes it particularly important that expenditure on road building and improvement obtain the greatest possible return in terms of economic and social development.

More-developed countries like the United Kingdom have been using methods of road planning and comparative analyses of individual projects involving cost/benefit studies for some time. In these, the benefits are sought mainly in easing the flow of existing traffic and allowing for future growth. These methods may be of some value in certain situations existing in less developed countries where vehicle density is high. Generally, however, the value of road building and improvement in these countries

R. S. P. Bonney is now directing  
a Road Research Laboratory  
research program in Tanzania.

lies in opening up new areas, improving social services, and promoting a viable exchange economy. These aspects of transport development, whilst crucial to economic and social progress in the less developed countries, have been the subject of very little research with, consequently, little in the way of guidance for the planners concerned with transport.

A series of investigations to remedy this deficiency in knowledge has been embarked upon by the Road Research Laboratory, commencing with a study in Uganda in 1958 and followed by the Sabah investigation of 1960-62. The intention is to investigate a series of different economic and social environments in relation to the transport facilities available. A basis of approach is sought to guide future studies and to lead to sounder methods of road planning.

### Sabah

Sabah (previously known as North Borneo), which forms the northern part of the island of Borneo, is slightly more than 29,000 square miles in area. Apart from the coastline, which is mainly alluvial flats and mangrove swamps, the country is very broken, with steep mountain ranges. Except for cultivated areas, the country is covered by dense jungle. Annual rainfall in most parts exceeds 100 inches, and it is hot and humid.

Most of the soils derive from sedimentary rocks and, apart from certain areas, are not very fertile. Fortunately rubber, the main crop, grows well on poor soils. Rubber acreage is fairly evenly divided between estates and smallholders, but the smallholder section is expanding more rapidly. Other important crops are coconuts, hemp, and cocoa, but timber is now the largest single export. Padi rice is the basic subsistence crop, and some districts grow it also for cash.

There is very little industrial development, and the transport facilities are almost entirely concerned with agricultural exports, food, and manufactured-goods imports. River transport is only of real importance on the East Coast, and the only railway connects the interior with the West Coast.

The population is 454,000 and growing at about 2.5 percent a year. The greater part of the population is indigenous or semi-indigenous, and most are farmers. Slightly less than 25 percent of the population is Chinese; apart from largely controlling commerce, they also play an important part in farming and in the timber industry. Race relations have always been very good with considerable cooperation in all fields.

## History of Sabah Transport

During the nineteenth century, transport and economic development were restricted to coastal areas and to those rivers which were navigable. As a result, export production was generally limited to high value-to-weight commodities such as tobacco and forest produce (e.g., edible birds' nests), which provided sufficient incentive for quite long carries to the coast. Sea transport has remained vital with the growth of the export-based economy, and facilities have expanded although, apart from local traffic, there is comparatively little freight traffic between the main ports.

Sabah, with its steep, mountainous terrain, is particularly difficult for railway construction. While construction began in 1896, these factors, together with the rapid development of the motor vehicle, affected the possible extension of the system.

Little road construction took place during the 1918-1939 period, and most of this was in the immediate vicinity of the coastal towns, but in the period 1947-1960, there was a considerable expansion in road mileage, particularly construction of "jeep tracks" to provide access to development areas. This was stimulated and made possible by three main factors: 1) shortage of accessible agricultural land for the rapidly growing population, 2) improved methods and equipment for road construction, and 3) development of comparatively cheap and reliable four-wheel-drive vehicles capable of operating over low-standard earth roads.

The following table compares the movement of passengers and freight by different means in 1959-60.

Table I. Passenger and Freight Traffic, 1959-60 in millions

|  | Passengers      | Passenger<br>Miles | Freight<br>Tons | Freight,<br>Ton/Miles | Vehicle or<br>Train Miles |
|--|-----------------|--------------------|-----------------|-----------------------|---------------------------|
| All roads<br>(of which<br>West<br>Coast) | 18.00<br>(4.70) | 91.00<br>(23.50)   | 1.27<br>(0.32)  | 14.00<br>(3.20)       | 37.00<br>(18.00)          |
| Rail                                     | 0.71            | 10.29              | 0.05            | 2.29                  | 0.34                      |
| Sea                                      | 0.137           | -                  | 0.279           | -                     | -                         |
| Internal air                             | 0.043           | -                  | 0.00036         | -                     | -                         |

Two interesting features emerge.

1) Comparing the area served by rail with the West Coast road section, both of which terminate in Jesselton and have similar associated populations, it is seen that commercial activity in the area served by road (measured by the amount of traffic) is much greater. Further, if road traffic in the rail-served area is treated as part of the rail system (as feeder services), then i) railroad passenger/miles are just over half passenger/miles for road only, but ii) freight ton/miles for the two areas are nearly the same.

2) In an area where the actual ton movements are high, the passenger movements are also high. There may be a causal relationship.

These two points give rise to the possibility, in Sabah with a growing smallholder economy, that development of an active exchange economy is dependent to a considerable extent on the facility with which people can move rather than freight. If true, it indicates that greater attention should be paid to making roads attractive to easy passenger movement at all times. That the railway does not compare favourably with road in meeting passenger requirements is not due to speed or price, where it compares favourably with road, but to the comparative infrequency of service and rigid schedules which have to be adhered to -- especially for the shorter distances of about 10 miles. The difference in commercial activity between rail- and road-served areas was further indicated in an investigation of retailers' turnover which, in basically similar areas, was found to be about 40 percent higher in those served by road networks.

#### Comparative Transport Costs

The following table compares operating costs for various forms of transport in Sabah in 1960.

Table II. Transport Operating Costs in Sabah, 1960

|                         | Cost<br>passenger/ml<br>\$ | Cost<br>ton/ml<br>\$ |
|-------------------------|----------------------------|----------------------|
| Road                    | 0.072                      | 0.362                |
| Rail                    | 0.132                      | 0.397                |
| River and coastal craft | 0.13                       | 0.80                 |
| Internal air            | 0.17                       | 1.67                 |
| Foot porters            | -                          | 50.00                |

[ 3.06 Malayan Dollars (\$) = 1 US \$ ]

The costs of air and foot services are such that, unless special circumstances obtain, they are unlikely to prove satisfactory

alternatives to road and rail. Although the costs of inland water transport, particularly for passengers, could be competitive with rail and perhaps road, this is more than countered by deficiencies in speed and flexibility. For the purposes of general economic development, the choice must, therefore, lie between road and rail, and here the choice is generally restricted to trunk routes.

Although the rail costs are high relative to both road and normal railway costs, this is not a reflection of the efficiency of operation, but rather of the operating environment. When the railway was first planned, the lengths of haul were to have been much greater and there was no immediate likelihood of a more efficient method of transport becoming available. It would be extremely unlikely for a railway to be built today to perform the functions expected of North Borneo Railways. It has been estimated that 500,000 tons of freight annually is the minimum figure for successful rail operation (unless there is also a very heavy passenger traffic), and that offering in Sabah at present is only one-tenth of this.

The costs computed below, which include all expenditures on the modes of transport, form a more realistic basis of comparison between road and rail than those in Table II which only considered the public sector of the transport industry.

Table III. Road/Rail Comparative Operating Costs

|      | Cost per Passenger Mile<br>\$ | Cost per Ton Mile<br>\$ |
|------|-------------------------------|-------------------------|
| Road | 0.104                         | 0.383                   |
| Rail | 0.13                          | 0.39                    |

It is seen that, despite the fact that much of the road transport is undertaken in low-capacity, four-wheel-drive vehicles operating over feeder roads, etc., road transport costs are slightly lower than rail costs. Average costs for the two forms of transport are close (and are reflected reasonably well in prices, except to the railway passenger whose average fare in 1959 was only 57 percent of the actual cost). However, if the numbers of passenger and ton movements per head of population are used as an index of commercial activity, total expenditure on road transport gives a much higher index number than expenditure on rail in this environment. This indicates that, in comparing different forms of transport, it is insufficient to consider only costs or prices per mile, since these may give little indication of the effect of a particular method on development. In the economic and social environment obtaining in Sabah, flexibility of transport appears to be of greater importance than price considerations, even on trunk routes.

With respect to costs, then, one may observe:

1) Commercial activity in the Sabah environment is not particularly sensitive to small price differentials in transport services.

2) Transport of goods and people per head of population appears to be closely associated with flexibility and freedom of movement.

3) Ease of passenger movement may be of greater importance in stimulating development than facilities for freight movement.

Despite close average costs for road and rail transport, the greater service and ease of travel provided by the road system leads to higher levels of development.

#### Agriculture, Marketing, and Traffic Volume

Of the total population of the nine districts examined in the investigation in 1960, 73.7 percent represented families that were farming an estimated 156,000 acres with an average holding size of 5.3 acres. The following table indicates the estimated proportions of the population engaged in farming and the average size of the holdings in relation to average distance from the main market centre.

Table IV. Agricultural Population and Holding Size, 1960

| District   | % of Working Population<br>Operating Land | Average Size of<br>Holdings | Average Distance<br>to Main Centre |
|------------|---|-----------------------------|------------------------------------|
| Sipitang   | 70  | 10.4 acres                  | 4 miles                            |
| Penampang  | 58  | 7.4 "                       | 10 "                               |
| Kudat      | 70  | 6.1 "                       | 15 "                               |
| Papar      | 60  | 5.8 "                       | 25 "                               |
| Tuaran     | 70  | 5.4 "                       | 25 "                               |
| Keningau   | 82  | 4.1 "                       | 30 "                               |
| Kota Belud | 86  | 3.8 "                       | 50 "                               |
| Tambunan   | 88  | 3.6 "                       | 65 "                               |
| Ranau      | 95  | 2.2 "                       | 75 "                               |

Correlation exists between distance from main market centre and both proportion of the population operating agricultural land and size of holding.

Agricultural produce comes into the main centre for sale and for local redistribution or export. Manufactured goods and services are supplied from the main centre. It appears that the distance to the main centre for the locality can be of crucial importance in the production of export crops, as is shown in Table V.



Table V. Export Crop Production and Distance from Commercial Centres

| District   | Commercial Centre | Average Distance of Farm from Centre | % of Total Acreage for Export Crops |
|------------|-------------------|--------------------------------------|-------------------------------------|
| Sipitang   | Sipitang          | 4 miles                              | 83                                  |
| Penampang  | Jesselton         | 10 "                                 | 73                                  |
| Kudat      | Kudat             | 15/20 "                              | 71                                  |
| Tuaran     | Jesselton         | 25 "                                 | 65                                  |
| Papar      | Jesselton         | 25 "                                 | 63                                  |
| Keningau   | Tenom             | 30 "                                 | 52                                  |
| Kota Belud | Jesselton         | 50 "                                 | 47                                  |
| Tambunan   | Tenom             | 65 "                                 | 44                                  |
| Ranau      | Jesselton         | 75 "                                 | 25                                  |

When considering the traffic between a trading centre and the surrounding area, traffic at any point on the system is likely to be a function of the potential productivity of the area served by the transport link and of the difficulty of the journey from the area to the trading centre. In a sophisticated society, the difficulty of the journey would be expressed in terms of transport costs. Where the transport system is not developed, the difficulty may be expressed in terms of the distance and of the effort involved in transport on the particular medium available.

Thus, we have the expression for the traffic flow at any point in the road system,

$$\frac{AP}{(KL)^n}$$

where P = the potential productivity of the area served by the road,  
L = the distance to the trading centre,  
A = some constant, and  
K = the effort involved per unit distance along the road reflecting particularly the standard of road provided.

For both the bituminous road and the earth roads, Q, the daily traffic flow found in our surveys, is inversely proportional to L, the distance from the trading centre -- i. e., n is approximately equal to one.

For the bituminous surfaced road, we found

$$Q = \frac{6000}{L} \quad (\text{approximately})$$

For the earth roads, we found

$$Q = \frac{600}{L} \quad (\text{approximately})$$

The areas served by the roads are of similar potential productivity. It is tempting to infer that the effort of traveling is locally construed to be ten times heavier on the earth road than on the bituminised road, but more data are required to substantiate the relationship.

Local crops are generally sold to the nearest shop or tamu (market/fair). Although on market days this may lead to a sharp rise in traffic, such increases in traffic do not follow any definite pattern.

For the purposes of this report, the measure of development used is areas of export crops.

### Road Building and Agricultural Development

This investigation aims at establishing the effects of the amount and standard of roads on development -- particularly in terms of agricultural acreages and traffic generation. However, it must be remembered that complementary investment in other fields is often essential in promoting development.

[ The study observed acreage expansion of cash crops associated with new roads. Then, based on the observations, a model was constructed to predict acreage expansion. The procedures are described below. The results, presented in Table VI, confirm the assumptions on which the model was based. ]

Using crop acreage statistics on an historical basis, the normal rate of planting was estimated and this compared with the actual rate during the period of road construction. The difference was assumed to be the increase in export crop planting in response to improved communications. The results were checked, where possible, by sample ground and aerial photography measurements. Then the estimated rate of natural growth in the period 1947-53, prior to the years of major road construction, was compared with the estimated agricultural development associated with road construction during the years 1954-60. This shows that, with road construction being the only variable which changed significantly between the two periods, the average annual planting rate of rubber and coconuts rose from 1096 acres in 1947-53 to 6793 acres in 1954-60.

A comparison of the rates of agricultural development in association with road building in Sabah indicates that the three most important ways by which individual roads can have a varying influence on the extent of land use are: 1) standard of road, especially in relation to the type of commodity produced in the areas which it serves, 2) the location of the road in relation to its surrounding terrain, and 3) the location of the road in relation to areas with growing population pressures on land.



### Area of Export Crops Per Mile of Road: A Model

These points are developed further to produce mathematical relationships and a model suggesting the mechanism of agricultural development in relation to road building. The method is based on the hypothesis that, assuming reasonably constant population pressure, the area of land used for export crops per mile of road is a function of 1) quality of land, 2) distance from the main commercial centre and market, and 3) standard of the road used.

The effects of the three factors given above were measured in the areas investigated and used to evolve a possible relationship, in mathematical terms, between agricultural development and amount and standard of road construction. The effects of complementary services and prices were assumed constant.

The evaluation and computation of the method is as follows:

1) Total area of land cultivated per mile of road. Based on census results, the average pattern of land use was related to distance from the road and quality of the land. This showed that the influence of the road on land use extended about five miles from the road at a decreasing rate. Thus, for one mile of road, the average area of influence is estimated at ten square miles. Of this total area, however, 100 percent use occurs only within half a mile of the road; beyond this the use of land is often controlled by historical accident or tradition. In all, the average area of land cultivated per mile of road is also affected by the quality of the land and corresponds to the expression:

$$\text{total agricultural acreage per mile} = 1015u,$$

where  $u$  represents the proportion of the total area served by the road that is cultivable for all crops.

2) The effect of distance on export crop production. The relationship derived from Table V between proportion of holding area used for export crops  $E$  and distance from the main commercial centre  $D$  in miles approximates the expression:

$$E = (0.80 - 0.0066D).$$

This is possibly not a very stable relationship. For instance, with increasing population or technical changes in production, processing, or transport methods, the market structure may change. This could reduce the value of  $D$ . However, it appeared to apply to the situation in Sabah in 1960.

3) The effect of road standards on export crop production. In some cases, it was found that the proportion of the holdings used for export crops fell considerably below what would be expected from a combination of the two expressions given above. It was found that a common feature in these areas was the necessity of traveling fairly long distances over substandard earth roads. This suggested that the lower proportion of export crop cultivation might be connected with the standard of service offered by these roads compared with all-weather and sealed roads. An expression was, therefore, evolved which goes some way toward indicating this effect:

$$R = 1 - \left( \frac{S - s}{K} L \right)^2 - \frac{L}{P}$$

where R = the weighting given to distance from the main commercial centre according to the road standard,

S = average speed of medium commercial vehicles on all-weather roads,

s = average speed of a commercial vehicle on the road serving the area in question,

L = distance to be traveled over the inferior length of road,

K = some constant which represents the importance of speed of travel or journey time to the local environment; this becomes smaller as speed becomes more important and in the Sabah environment was given a value of 1,000,

P = some constant which reflects comfort or difficulties of travel on non-all-weather roads in relation to distance; in Sabah, the value of 200 was used.

Data and examples were limited, and this is only a tentative expression as far as the actual values go, although the mechanism is considered realistic.

The three above expressions are combined to give one equation used to estimate the area of export crops per mile of road:

$$\text{area of export crops} = 1015u (0.80 - 0.0066D) \left[ 1 - \left( \frac{S - s}{1000} L \right)^2 - \frac{L}{200} \right]$$

This expression is plotted in Figure I for three classes of roads.

There are obviously other factors which, at the present state of knowledge, cannot be taken into account in this type of formula. These relate particularly to the lack of homogeneity in tradition, education, skills, and so forth in most areas. Until sufficient planning exercises have been completed and their results observed, the effect of these social and human factors cannot be quantified and their relative importance will have to be judged on local knowledge.

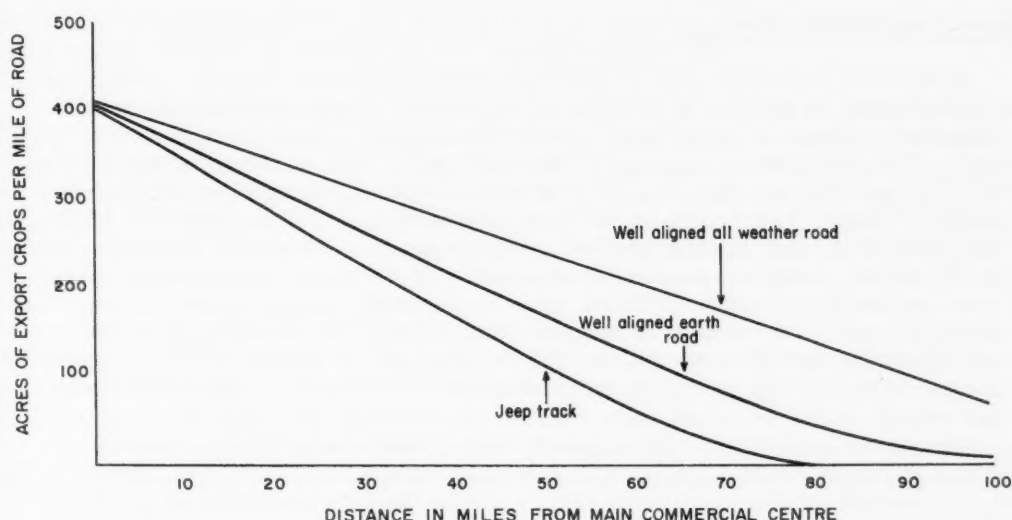


Figure I. AREA OF EXPORT CROPS GENERATED PER MILE OF NEW ROAD IN RELATION TO DISTANCE AND STANDARD OF ROAD

Table VI. Acreage Increases from Development Roads

| District   | Percent of Land Cultivable | Observed   |             | Predicted by Model |             |
|------------|----------------------------|------------|-------------|--------------------|-------------|
|            |                            | acres/mile | total acres | acres/mile         | total acres |
| Kudat      | 65                         | 400        | 10,000      | 440                | 11,000      |
| Ranau      | 20                         | 30         | 600         | 30                 | 600         |
| Kota Belud | 40                         | 136        | 2,300       | 180                | 3,100       |
| Tuaran     | 50                         | 300        | 5,660       | 310                | 6,000       |
| Penampang  | 50                         | 310        | 1,700       | 360                | 2,000       |
| Papar      | 60                         | 400        | 4,000       | 430                | 4,300       |
| Keningau   | 50                         | 240        | 6,500       | 290                | 7,800       |
| Tambunan   | 40                         | 70         | 1,900       | 120                | 3,100       |
| Sipitang   | 50                         | 360        | 4,000       | 380                | 4,200       |

The model tends to give higher figures than the observations, since it includes more varieties of crops.

If, by this method, an understanding is obtained of the transport facilities needed for agricultural communities, planned development will be easier to implement with greater opportunities of success, and individual schemes easier to evaluate and compare. The most likely factor to affect the results (apart from human considerations) is the method of agriculture and associated crops, climate, etc.

## Comparison with Mexico

A similar development situation exists in Mexico where, using the same formula, a figure of 974 acres of export crops per mile of road is obtained. This is twice the figure obtained for Kudat district in Sabah. The difference is mainly caused by the higher proportion of the total area served by the road that is cultivable in Mexico as compared to Sabah. Thus, the value in the formula in Sabah 1015u rises to 3017u in Mexico, although the estimated total area of influence in the Mexican case is only 9.3 square miles compared with 10 square miles per mile of road in the Sabah case. This, it is suggested, is because the main crop in this part of Mexico is sugarcane, which does not require the same constant attention as rubber, and because of lower rainfall, permitting collection by vehicles operating cross-country. An additional factor which must be taken into consideration with the type of crop is the tonnage to be moved. If, as with sugar, the weight to be moved within a given time is high, requiring large vehicles, it is possible that the values in the section of the formula dealing with the road standard would have to be altered.

## Conclusions

These suggested analytic tools, based on experience in only one country, are of limited value. Although they may at present be applied usefully in Sabah, the data on which they are based could profitably be extended. The values used will probably vary with local environment -- crop types, climate, etc.

The application of these tools can only be considered properly against the background of general economic and social development which -- in most developing countries -- must be based on efficient exploitation of natural resources and the capabilities of the people. Investment, making use of scarce funds, must, therefore, be used in such a way as to provide the greatest returns in these fields. However, the return in terms of development directly attributable to transport availability can be affected considerably by associated investment in education, irrigation, etc. Despite these limitations, the cost of development in terms of basic transport needs, without which other investment would probably be wasted, is an essential starting point in the evaluation of any proposed development project.

In Sabah, investment effort has logically been concentrated on developing a viable economy based on agriculture and in attempting to overcome the problem of bringing new areas of agricultural land and potential settlers together. The tools developed during the course of the Road Research Laboratory's investigation will assist in achieving these objectives by making sure that the transport needs are met adequately at the lowest possible total transport cost; they also reduce the

element of judgement required in decision making and indicate the basic data which should be collected for planning purposes.

Industrial and commercial activity is generally of greater importance in generating traffic and, therefore, in overall transport requirements than agriculture, although in most developing countries, diversification of the economy must be soundly based on efficient production of primary products. In the absence of data on the value of nonagricultural activity, rates of return or cost/benefit ratios cannot be calculated. Sabah is in an early stage of development where agriculture is still the major activity. As agriculture becomes a smaller part of total economic activity, the method of calculating generated traffic may have to be reexamined; similarly, the method may also have to be revised as the average level of per capita income rises.

The most important aspect of economic and social advance is the development of commercial and industrial activity. Methods need to be developed for expressing this activity in terms of transport needs. This, though, is as yet some way ahead. The prime need now is for further studies in different environments to establish these relationships. Such studies are likely to produce conclusions of immediate value locally, as well as to provide experience on which general methods of transport planning can be based.

## ECONOMIC EFFECTS OF THE FRIENDSHIP HIGHWAY

Wisit Kasiraksa

[ Thesis Number 41, SEATO Graduate School of  
Engineering, Bangkok, Thailand, 1963, 59 pp. ]

[ These excerpts from a thesis prepared at the SEATO Graduate School of Engineering in Bangkok illustrate the kind of useful research and evaluation that is being done. It should be noted that the economic effects studied occurred despite the fact that an undetermined amount of the traffic increase was not primarily economic, i. e., military. Subsequent analysis has shown that, after a large initial increase upon completion, the road's traffic has grown modestly. ]

These are  
excerpts  
from the  
thesis.

The purpose of this research is to study the economic benefits which result from the construction of development roads. The study areas were the changwads (provinces) traversed by the Friendship Highway in Thailand: Saraburi and Korat changwads. Those areas traversed by the Korat-Nongkai Highway, the extension to the north from the Friendship Highway, and the Surin-Roi-ed area in eastern Thailand served as control cases for the economic growth study. The existing Korat-Nongkai road was, at the time of writing, in very poor condition. Travel over this dusty washboard road is extremely trying on both vehicle and occupants.

Wisit Kasiraksa is a transportation engineer  
with Deleuw, Cather and Company,  
Consulting Engineers, Bangkok.



### Traffic on the Highway

The Friendship Highway has been in operation since 1958. Traffic on the highway comprises that which has been diverted from the route through Lopburi, that induced by the new facility, that converted from the railroad, and that resulting from the growth of vehicle registrations. Prior to 1957, there was no road along the route. After approximately five years of service, the average daily traffic at the southern end of the road is 1000 vehicles per day, which is apportioned by vehicle type as follows:

|                |            |
|----------------|------------|
| Passenger cars | 27 percent |
| Trucks         | 51 "       |
| Buses          | 22 "       |

Before the completion of the Friendship Highway, the traveller between Saraburi and Korat had to spend almost 11 hours in travelling the old, rough, and roundabout road. The old road is unpaved and very poor; it is not accessible during the rainy season, and can be travelled upon by ordinary vehicles only under the most favourable conditions. In the dry season, the dusty, corrugated surface inflicts severe punishment on vehicles and their occupants, thus discouraging personal travel. These conditions inflated the cost of transportation in terms of maintenance, tire wear, depreciation, labor time, and uncertainty of delivery time, to a level that inhibited the growth of the trucking industry and, more seriously, retarded the economic development of the region.

With the completion of the Friendship Highway to first-class standards of design and construction, travel between Saraburi and Korat became direct, faster, and safer. One of the most important benefits has been the reduction in cost of transportation. It is widely accepted that improved transportation affects economic development by encouraging the greater production of existing commodities and initiating new production. The effects of improved transportation may be transmitted to ultimate consumers through lower costs and better quality of services rendered.

### Sources of the Traffic

How much of the highway traffic was converted from the railroad? The completion of the Friendship Highway in mid-1958 resulted in an immediate and sharp decline in passenger, carload, and less-than-carload freight traffic on the Northeast line of the State Railway of Thailand. The losses were about 70 tons per day of freight and 50 passengers per day. The decline in traffic on this line represented a serious loss for the railroad.

Highway-bus travel between Bangkok and Korat costs  $\text{฿ } 23$  [20.83 Bahts = 1 \$US] less than the railroad fare, a reduction of more than 50 percent. With the advent of lower fares, highway-bus travel became more attractive than rail transportation; this resulted in a reduction of rail passengers. Passengers traveling from Bangkok to Korat by highway bus save  $3\frac{1}{2}$  hours. In point of economy, this represents a substantial saving at even modest money values of time.

Both highway and rail transportation offer their patrons specific advantages. Some transportation could not have been provided conveniently by the railroad, either because it was created by a motor vehicle or because it originated or terminated in areas not served by the railroad. In some instances, the advantages of trucks are considerable. Truck hauling within certain distances is often more convenient than shipment by rail and may require less hauling, since a truck can pick up a shipment at the platform of the consignor and deliver it to the door of the consignee.

The Express Transportation Organisation of the Government of Thailand reports the average payload of a truck in Thailand to be 4 tons. Thus, 70 tons per day converted from the railroad would require 18 trucks. The average bus load in Thailand is 29 passengers. Thus, two buses per day are expected to have resulted from rail passenger losses. The total converted traffic amounts to 20 vehicles per day or 2 percent of the traffic on the new highway.

The kinds and sources of traffic have been summarized in Table I.

Table I. Types and Sources of Traffic on the Friendship Highway

| Kind          | Source           | Average Daily Traffic | Percent |
|---------------|------------------|-----------------------|---------|
| Diverted      | Old road         | 100                   | 10      |
| Converted     | Bangkok railroad | 20                    | 2       |
| Induced       | Local            | 430                   | 43      |
| Induced       | Long haul        | 450                   | 45      |
| Total traffic |                  | 1000                  | 100     |

Source: Royal Thai Highway Department

These data refer to the new facility only. Of interest also is the effect of the new highway on existing roads. Significant facts have been set forth for comparison in Table II.

Thirty percent of the traffic on the Bangkok-Saraburi road, 11 percent of that on the Saraburi-Lopburi road, and 19 percent of that on the Korat-Nongkhai road continued its journey on the Friendship Highway. Thus, this increase in traffic on adjacent roads is also attributable to the new highway.

Table II. Effect of Opening of Friendship Highway on Average Daily Traffic on Other Roads in Vicinity

| Road             | Traffic Volume<br>(Average Daily Traffic) |              |               | Amount Assignable<br>to Friendship<br>Highway |                        | Amount<br>Attributable to<br>Normal Growth |                        |
|------------------|---|--------------|---------------|---|------------------------|--|------------------------|
|                  | Before<br>(A)                             | After<br>(B) | Change<br>(C) | Vehicles<br>per<br>Day<br>(D)                 | Percent<br>of A<br>(E) | Vehicles<br>per<br>Day<br>(F)              | Percent<br>of B<br>(G) |
| Bangkok-Saraburi | 1120                                      | 1890         | +770          | 340   | 30                     | 430  | 38                     |
| Saraburi-Lopburi | 1390                                      | 1730         | +340          | 150   | 11                     | 190  | 14                     |
| Korat-Nongkai    | 425                                       | 700          | +275          | 80  | 19                     | 195  | 46                     |

### Agricultural Development

From available evidence, it appears that the Friendship Highway has played an important role in agricultural production. Increases in the production of existing commodities and opening up new land for cultivation through the areas it traverses have contributed to a remarkable increase in agricultural production. The Friendship Highway has enabled farmers in the changwads of Saraburi and Korat to deliver their fresh produce directly to markets in Bangkok or Korat, where there are large consumer demands, in much shorter time than by rail transportation. In the succeeding paragraphs, some of these changes are investigated.

Crop production. Crops in this region are roughly classified into two categories, upland crops and vegetables. Upland crops are sugar cane, maize, bananas, potatoes, pineapples, castor beans, kenaf, jute, rami, beans, watermelon, yams, pumpkin, tobacco, and cotton. Types of vegetables grown in this area are chili, Chinese mustard, Chinese olives, eggplant, cabbage, cow peas, onions, cauliflower, and others.

In 1957, selected as a base year for comparisons, 252,314 metric tons of upland crops and vegetables were produced in the two changwads traversed by the Friendship Highway. In 1959, the comparable figure was 415,451 metric tons, 1.64 times the production during the base year. In 1960, it was 607,304 metric tons, 2.4 times that of the base year, and in 1961, it became 664,675 metric tons, 2.63 times the production achieved during the base year. There were only small increases in crop production in the Korat-Nongkai and Surin-Roi-ied highway areas, the reference areas, during the same period.

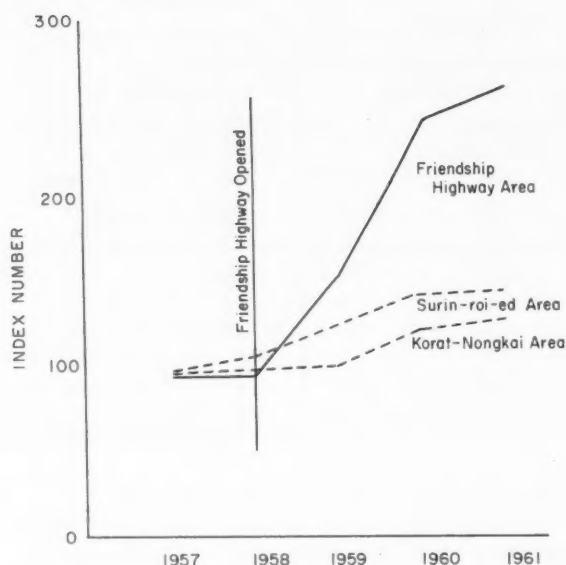


Figure I. PRODUCTION OF UPLAND CROPS AND VEGETABLES

showed an increase of only 20 percent. After two years of operation of the Friendship Highway, the production of poultry in Saraburi and Korat changwads was 1.65 times that of the reference area in which highway improvements had not been effected. The Friendship Highway had but a modest effect upon the production of swine in Korat and Saraburi changwads. The small observed increments display an upward trend, however, as compared with wide fluctuations in the control area.

Rice production. The Friendship Highway appears to have played no role in the production of rice. The trend of paddy production indicates a low degree of correlation with the state of transportation development. Soil conditions, drought, flood, and other agricultural factors appear to govern the production of rice.

#### Other Effects

To all economic benefits must be added the broadened scope for social activities which a development road brings; in underdeveloped regions in particular, such advantages will raise standards of health and permit schools to be opened. Everywhere, new roads will encourage consolidation of a community of interest, facilitate social intercourse, and widen the scope for recreational activities. The satisfactory use of leisure time has an undoubted, beneficial effect upon man's productive capacity which, in turn, is reflected in growth of the national income. It can be inferred that development roads act as a catalyst to general development and accelerate the rate of economic progress of a region or country.

#### Livestock production.

The trend in the production of poultry in the Friendship Highway area showed a steady rise, whilst the Korat-Nongkai highway area displayed wide fluctuations. In 1959, the production of poultry in the Friendship Highway area was 2,543,798 units, 1.74 times that of 1956, whilst the Korat-Nongkai highway area showed a decline in the production of poultry, 731,542 units less, being 21 percent lower than in 1956. In 1960, the production of poultry in the Friendship Highway area was 2,744,154 units, 1.87 times that of the base year, while the data for the

Korat-Nongkai highway area

## A REVIEW

Harral, Clell G., "Preparation and Appraisal of Transport Projects," Washington (D. C.), the Brookings Institution, 1965, 142 pp., single copies available upon request.

With a good cook book, a diligent but inexperienced cook can prepare an acceptable meal. Using "Preparation and Appraisal of Transport Projects," a diligent planner -- even with no more than an elementary knowledge of economics and mathematics -- should be able to improve his decisions on use of resources for transport, given the existing tools and the data at his disposal.

Investment choices in the field of social overhead capital are notoriously difficult. Some of the articles in this section indicate the simplifying assumptions that have been made in some of the most careful studies evaluating road investment. This book presents all of the techniques ideally involved with surprising simplicity and thoroughness. The author realizes that many of the data needed to evaluate the benefits of transport investment and to compare it to alternative investments are sure to be missing. However, he insists that, when a datum is missing, the best solution is not to set it equal to zero, but to estimate it -- in fact, to determine the implications for the project of assuming the upper and lower plausible limits for the datum.

Transport decision making is disaggregated in the book. Step by step, it shows how to identify alternative courses of action, how to set up a transport study, how to determine capacity and map traffic, how to project traffic, et al. Examples and summary tables are provided.

Of course, the knottiest problem is how to determine the benefits from transport investments. A lot of estimating is certainly required. Here, as elsewhere in the study, the author insists that the investments be seen in the context of the national economy, which is what must interest the planner. He is careful to specify those benefits which must be considered in a national income approach to benefits, but which are excluded from cost-savings, shippers'-savings, or land-value approaches. In this case, examples for roads in El Salvador and Bolivia show what data were available and how the necessary estimates were made from them.

For choosing between alternatives, the importance of considering all reasonable alternatives in order to arrive at an optimal solution is emphasized. As a rule of thumb, six types of alternatives should be considered: 1) allocation of funds to other industries, 2) to transport substitutes, 3) choice among different modes of transport, 4) among different scales and designs for the project and their spacing over time, 5) improvement of the present system by changing regulations, administration, or operational efficiency, 6) by changing rate and tariff structures. Once alternatives have been considered and their costs and benefits determined, decision should be based on the largest discounted net benefit. The study shows what this is, how you arrive at it, and why it is superior to other decision criteria such as benefit-cost ratios (total and net) and internal rate of return.

After reading this book, a decision maker may be convinced that he would need an army of statisticians and assistants plus a computer to arrive at optimal transport investment decisions. If all of the survey and calculation procedures indicated in this book were followed in detail, such would probably be the case. However, the need to estimate and the limited number of realistic alternatives probably shorten the process drastically. The author insists that the decision maker must, at least, go through an abbreviated form of the procedure presented before he can be assured of having come as close to an optimal decision as circumstances permit.

This book was prepared by the Brookings Transport Research Program after a thorough review of transport preinvestment surveys used by the World Bank and the Agency for International Development revealed their shortcomings. It provides an excellent guide for those who must make transport investment decisions. Present plans do not call for the publication of this book. It would be desirable if it could be made more generally available. A few hundred mimeographed copies have been distributed by AID and the Brookings Institution. The latter will furnish copies to administrators and research workers as long as its supply lasts.



## THE GOVERNMENT BUDGET AND PLANNING

### ANNUAL BUDGET AND PLAN IMPLEMENTATION

William I. Abraham

[ From Annual Budgeting and Development Planning, Washington (D. C.), National Planning Association, Center for Development Planning, Planning Methods Series No. 1, 1965, US\$ 1.00, 37 pp. ]

These are excerpts from the monograph.

Although the budget is not the only avenue for influencing economic activity and thus for promoting economic development, nevertheless, the government's budget is probably the single most important instrument of development policy. Public spending and taxing both express priorities within the public sector itself and influence the pace and direction of economic activity within the private sphere.

Despite the obvious need for the closest relations between the budget agency and the central planners, experience shows that the required degree of cooperation is hard to attain. While planning has been known to fail where the budget does reflect plan objectives, more often planning is ineffective because the budget does not translate the plan into action. The plan remains basically a blueprint. As such, it may provide valuable guidelines that directly or indirectly influence real events. But, without a wholehearted and sustained effort to put a development plan into effect, the setting up of planning machinery and the formulation and promulgation of a plan are, of course, but the shadow of planning.

William I. Abraham is Professor of Economics, New York University, New York.

What are the reasons for the divergence between the plan and the budget? Even where there is an earnest desire to implement the development plan, if the plan is drawn up to cover a span of years without indicating what is to be achieved each year, coordination of the annual budget with the plan is made difficult. It is more difficult still if planners fail to distinguish clearly between programs in the public and in the private sectors. The very fact that budget and plan officials represent different agencies with differing responsibilities and points of view makes for difficulties. Furthermore, in some countries, the nature of the budget and budget process make budget-plan integration difficult.

While budget-plan coordination is a necessary condition for effective plan implementation, it is, of course, by no means a sufficient condition. Often the major obstacles are social, political, and cultural. Plans may also be stillborn because they are totally unrealistic, or because of external developments over which the country has no control, or because of political upheavals, or for other reasons. In any case, in the long chain of events between the formulation of a development plan and its realization, appropriate budgetary action is one of the most vital links.

It is now widely appreciated that, in most countries, too little attention has been paid to the arrangements for plan execution. Planning officials have tended to concentrate unduly on ends at the expense of means and to equate the existence of a plan with its execution. Even planning advisers and development economists appear to have taken for granted that the variables in their models could be readily manipulated -- a convenient but unrealistic assumption, as they themselves would be the first to admit.

#### Adapting Budget Form to Development Needs

The annual plan, by spelling out for the year the physical and possibly also the financial programs that are within the scope of the public sector, provides the substance for budgetary action by central, state, and local governments. The form of the budget is thus a factor in plan implementation.

Since World War II there has been considerable discussion about the form that the annual budget should take. The conventional or "administrative" budget showing salaries, cost of materials, etc., is framed to facilitate legal accountability. In this form, it has a number of shortcomings, of which three grow out of the system of classification: 1) it is difficult to analyze the impact of governmental transactions on the total economy, 2) it is difficult to see for what broad purposes resources are being allocated, and 3) it is unsatisfactory as a basis for judging progress toward desired public-sector goals.

Economic classification of budget. In order to meet the first objection, i. e., to make the budget statement a more useful tool of economic analysis, it is necessary to arrange the expenditures and receipts of all levels of government by significant economic categories, distinguishing current from capital outlays, spending for goods and services from transfers to individuals and similar payments, tax receipts by kind from other receipts and from borrowing and intergovernmental grants, etc. Reclassified in this way, the flows into and out of the government sector can be related to important categories of transactions influencing the behavior of the other sectors of the economy.

The national-income type of government account is the most familiar example of an economic classification of the budget. Such a sector account for government, an integral part of a system of national income accounts, permits us to trace through systematically the influence of public transactions on the other parts of the economy (and vice versa). The economic classification of the budget also enables us to determine how much of the national income originates in government activity, how large a part of the national product is purchased by government, and so on. Because of the widespread use of national income analysis and the efforts of international organizations at standardizing national income accounting and upgrading government budgeting, many underdeveloped countries now provide an economic classification of the budget, although not always in adequate detail.

Two UN publications provide guidance in preparing such an account: A Manual for Economic and Functional Classification of Government Transactions and A System of National Accounts and Supporting Tables (ST/TAA/M/12, ST/ECA/49, New York: UN, 1958; and ST/STAT/SER.F/2/Rev. 2, New York: UN, 1964).

Functional classification of expenditures. The second shortcoming of the conventional budget classification is the difficulty of determining how expenditures are being allocated among the different kinds of services, such as defense, education, health, agriculture, transport, and others. The economic classification described above does not, of course, provide information on public expenditures according to purpose or function. This information can be obtained only by rearranging expenditures according to the function served irrespective of the organizational unit responsible for performing the services. Only when such a breakdown is available does it become possible to relate government activities as reflected in the budget to economic development plans. At the same time, a reclassification of the budget should specify, for example, whether the outlays on agriculture take the form of current expenditures, capital expenditures, subsidies to farmers, loans to farmers, etc. The general lines of such a classification are shown schematically below.

Table I. Economic-Functional Classification of Expenditures

| Purpose                    | Current Outlays  |           |                   | Capital Outlays  |            |                           |
|----------------------------|------------------|-----------|-------------------|------------------|------------|---------------------------|
|                            | Goods & Services | Subsidies | Transfer Payments | Interest on Debt | Investment | Transfer Payments Lending |
| General:                   |                  |           |                   |                  |            |                           |
| Defense                    |                  |           |                   |                  |            |                           |
| Other                      |                  |           |                   |                  |            |                           |
| Economic-Social:           |                  |           |                   |                  |            |                           |
| Education                  |                  |           |                   |                  |            |                           |
| Health                     |                  |           |                   |                  |            |                           |
| Other Social               |                  |           |                   |                  |            |                           |
| Agriculture                |                  |           |                   |                  |            |                           |
| Power & Energy             |                  |           |                   |                  |            |                           |
| Transport & Communications |                  |           |                   |                  |            |                           |
| Other Industry             |                  |           |                   |                  |            |                           |
| Unallocable                |                  |           |                   |                  |            |                           |

Performance budgeting. As its third shortcoming, the conventional budget does not permit us to judge performance in fulfilling particular goals in the public sector. This is so for two reasons: 1) the administrative budget is concerned with the objects of expenditures by organizational unit rather than with the broad purposes for which expenditures are made and 2) the concrete means by which these broad purposes are to be advanced are not readily identifiable. A budget which discloses the programs, projects, or activities that are the elements by which national goals or purposes are to be achieved provides a firmer basis for integrating budgeting and planning. Of course, a budget that focuses on programs, their costs, and their results has inherent advantages quite apart from any relevance to long-term planning.

The United States and the Philippines were the first countries to introduce program and performance budgeting, the former in 1951, the latter a few years later. In the Philippines, the performance budget has replaced the traditional budget and has led to important organizational changes. These developments were the outcome of concern with the efficiency of the budget process. Only later did it come to be recognized that, by facilitating more effective cooperation between the budget and planning agencies, the techniques involved could be important for planning. At the present time, Colombia, Bolivia, Venezuela, Peru, Honduras, and other South and Central American countries are either using or introducing performance budgeting. The same is true of China (Taiwan), Thailand, Israel, the U. A. R., Iran, and Ghana.

Performance budgeting is closely related to the functional classification of government transactions. However, it provides for subfunctions with an identifiable end product that can be measured so as to evaluate performance. Thus, under the broad function of transport, road building might be distinguished, for which the unit of measurement could be miles of road constructed; another program might be maintenance and repair of roads, the measurement unit being miles of road serviced; and so on. Forest service, which comes under the heading of agriculture, might be split up into the following well-defined programs to help determine the effectiveness of the government's expenditures: forest protection and use, acquisition of lands for forests, brush disposal, roads and trails, etc. In the Philippines, the services of the internal revenue bureau are divided into four activities: 1) tax rulings and other legal services, 2) tax assessment, 3) tax collection, and 4) general administration.

Obviously, the programs and activities distinguished, the performance measurement units selected and, in fact, the extent to which the performance concept can sensibly be applied to the various areas of government will depend on many different considerations and cannot be uniformly prescribed for all countries. The concept is most clearly applicable to expenditures that lead to some homogeneous physical

output. While the output of projects in the fields of education and health can perhaps be calculated, there is no unique or completely satisfactory unit of measurement (the same difficulty crops up in making comparisons of real GNP over time). Where the output is still more general, as with administration, or unpredictable, as with research, no useful unit of accomplishment may exist, no matter how the activity is subdivided. But, where performance can be reasonably measured, a basis exists for a useful review of programs.

While it stands to reason that performance budgeting should assist in the implementation of development plans, the fact that few of the countries that use it would rate high marks for executing their plans (while more successful countries have yet to adopt the approach) confirms the observation that techniques are not a substitute for a determined effort. Nevertheless, in those cases where planning remains an academic exercise mainly for lack of know-how rather than for deep-seated political reasons, improved budgeting techniques may yet turn out to be of crucial importance.

The UN Fiscal and Financial Branch has done a great deal to spread knowledge of better budget practices. In recent years, with the surge of interest in development planning, it has focused more on performance budgeting, stressing its advantages for long-term planning. Its fullest statement is to be found in A Manual for Programme Budgeting (E/CN.12/BRW.2/L.5, New York: UN, 1962), prepared for the 1962 Latin American budget workshop. This report, however, has hardly anything to say about budgeting in relation to development planning and is concerned chiefly with fiscal management as such. There would seem to be room for a "how to do it" manual that bridges the gap between planning and budgeting, with emphasis on practical and administrative problems.

#### Other Problems of Budget Administration

While widespread improvements have been taking place in the form of the budget since World War II, comparable progress has not been made in other important areas, and the failings have been underscored by the increasing scale and complexity of government activities during this period.

Controlling government spending. In a considerable number of countries, there is still very little effective centralized control over large areas of government spending. This comes about for a variety of reasons. Expenditures may bear little relationship to budget estimates because of loose financial controls, the prospect of supplementary or "emergency" appropriations to cover shortages, the weak position of the budget agency, etc. In some countries, earmarked taxes are a complicating element in the fiscal picture. But, even where the



government departments covered in the regular budget are effectively controlled, the activities of agencies "outside the budget," of public enterprises, and of other semiautonomous institutions will scarcely be reflected in the budget, except insofar as there may be transfers of income to the government's central funds or subsidy payments out of these funds.

In countries where the public sector, broadly defined, goes far beyond the activities of the government's regular departments, the importance of the central budget for mobilizing and allocating public resources may be greatly reduced and governmental objectives jeopardized. It becomes especially difficult to follow coordinated policies when autonomous agencies are in the hands of political and military figures. In these cases, the bald budget statement considered alone provides a misleading account of the level and directions of public activity. Unless a conscious attempt is made to adjust it for the revenues and expenditures of government agencies that are not really enterprises but are nonetheless outside the normal budget, a comprehensive picture of even the central government's ordinary activities will not emerge. If all the ramifications of government are to be revealed, a systematic survey of at least the major public enterprises, defined in some reasonable fashion, has also to be undertaken from time to time. Purposes, methods of financing, investment policies, and other important characteristics should be made clear.

Managing public enterprises. There are often sound reasons for the autonomous character of public enterprises, which may range from postal systems and national railways to pawnshops. However, where important public enterprises have such a degree of independence that governments cannot fit their activities into plans for the public sector, the effectiveness of planning suffers. At the same time, of course, there exists the opposite danger, that of bureaucratic or political interference with effective management. Judging by the experience of underdeveloped countries, it is not easy to achieve a sound balance of government control and independent management. Loose financial controls and the flexibility of accounting standards cause some of these undertakings to rank among the main sources of graft and illegal gains. It is, no doubt, partly for this very reason that full disclosure of the financial and commercial operations is sometimes obstructed.

Coordinating local and central government budgets. At the levels of the regional and local governments, budgets and budget administration may be even more seriously deficient. In any event, where regional and local governments are important in relation to the central government, it is vital that the finance ministry, budget bureau, or interior ministry develop systematic records of their fiscal activities by means of regular questionnaire surveys. No government sector account with large omissions for lesser governmental units can be very meaningful

either for general economic analyses or for studies of taxation, the allocation of resources, etc. What is required is at least a consolidated statement covering government at all levels. Furthermore, since the implementation of a development policy requires decentralized administrative action, effective budget-plan coordination implies cooperation between local and central budget officials. Such cooperation seems to be loose, at best, in many cases, if one may judge from the character of the fiscal data for lower levels of government in the files of finance ministries and other interested central offices.

### The Shortcomings of Current Practice

While budget-plan coordination is a sine qua non of effective plan implementation, the plain fact is that, in most underdeveloped countries with development plans, the degree of coordination which is achieved leaves a great deal to be desired. Planning and budgeting nearly always take place in different ministries, each with its own outlook. Where budgetary action is at variance with planning, it is really the budget (and other influential government programs) that shapes the nation's development, not the plan. To cite but a single example, in the Philippines, the priorities of the Budget Commission have not been the same as those of the National Economic Council, which is the official, long-term planning body; furthermore, the Central Bank has allocated foreign exchange and the Development Bank has engaged in lending without reference to the plan.

Planning, as opposed to budgeting, is concerned with the guidance of the entire economy, not only the public sector; it must look ahead many years, not only to the next fiscal year; it expresses a nation's whole political philosophy, going beyond public priorities and action. As a result, its aims are more complex and its methods less certain than simply mobilizing resources for collective use. Yet developments within the public sector are of critical concern to planners, and an important measure of control over these developments is an indispensable condition of effective planning. For this reason, it has been suggested that planning and budgeting be merged in a single agency.

This suggestion probably has most merit where, in the absence of a formal, comprehensive development plan, a multiyear capital expenditure program or set of public priorities represents planning for all practical purposes. As was the case in Israel until recently, a plan in this sense can be successfully merged with ordinary budget functions. The suggestion also has merit where the planning agency prepares annual plans and where it is feasible to have a high-level interdepartmental development committee which will prepare the budget recommendations with the annual plans in mind. It is easy to imagine, however, that, in many situations, the quality of planning would suffer if planners were sucked into the administrative routine of budgeting and

became obsessed with the need for economy and stringent financial controls. Furthermore, if a government were not really prepared to back a development plan, it is doubtful that the budget would reflect plan priorities merely because of formal administrative relationships.

The divergence between budgets and plans often reflects the dominant position of the finance ministry whenever it includes the budget office. While it is possible to visualize the planning and budgetary functions' being carried on together in the prime minister's office, to move planning into a ministry of finance, which already controls the budget, can be expected to arouse the antagonism of the other ministries whose cooperation is so essential if planning is not to take place in a vacuum. Nevertheless, it is necessary to find a way of wedding the work of the two groups so that the priorities of the planners are carried over into the budgeting process.

### Translating Plans into Budgetary Action

A real difficulty here is that, so often, plans are not really translatable into budgetary action. Planning agencies need to be much more concerned with preparing annual plans that can be a basis for concrete action by the budget authorities. One reason why Indian planning has shown results is that, starting with the Second Five Year Plan, the Planning Commission has prepared annual plans for the central government and the states. These plans serve as the basis for the budgets of these governments. The Planning Commission even checks back with the state governments, after their budgets have been prepared, to see whether plan outlays included in the budgets agree with those in the annual plans. Without operational plans of this sort, planning agencies can hardly hope to impose priorities on governmental spending or influence fiscal policy in other ways. Redrawing organizational lines cannot substitute for the intense cooperative effort that the preparation of realistic annual plans entails, although, in some cases, it may pave the way.

In Malaya, where the planning and budgeting functions have been more successfully integrated than in most countries, a National Development Planning Committee of senior civil servants representing various ministries prepares recommendations for cabinet action on the annual development plan and capital budget. Although the chairman is the Permanent Secretary of the Finance Ministry, it is the Economic Planning Unit of the Prime Minister's Department that serves as the secretariat. The Economic Planning Unit is thus concerned both with long-term plans and with annual plans to be incorporated into the budget. In Venezuela and Iran, it is also the plan organization rather than the finance ministry that is responsible for the annual capital budget.

Concern with capital budgets should not mean pushing the government's current expenditures into the background. In the first place, capital outlays inevitably lead to current expenditures for staffing, upkeep, etc. In the second place, outlays for improving human resources, for research, for improving agricultural extension services, and so on, while they do not add to the stock of capital, are not any the less developmental for this reason. Disregarding current costs gives a lopsided and misleading view of priorities. Durability alone is not a very useful criterion for allocating resources.

The coordination of budgets and plans would also be facilitated if budget bureaus looked beyond the next fiscal year and prepared estimates of receipts and expenditures for some years ahead or for the plan period. Such an initiative would be especially valuable in countries where the central planners themselves did not go beyond providing a medium-term plan and also where there existed no formal development plan or planning machinery. The multiyear budget would, of course, have to be drawn up in close collaboration with the plan agency if prospective expenditures were to take into account the cost of developmental programs under consideration. In estimating revenues, anticipated changes in tax legislation, foreign assistance, and other relevant factors would need to be considered. The adequacy of financial resources likely to be available to the government to cover its ordinary and developmental expenditures without resorting to inflationary finance could thus be assessed. Projections along these lines for the public sector have inevitably to be made somewhere if planning is to be realistic and if the budget for any particular year is to be appreciated as a link in a chain of past and future budgets.

## PROGRAM AND PERFORMANCE BUDGETING

Albert Waterston

[ From Development Planning; Lessons of Experience, Baltimore (Md.), The Johns Hopkins Press, 1965, US\$ 10.75, pp. 233-243. ]

These are excerpts from a portion of the book.

Some budget specialists are convinced that mere reclassification of government transactions from the usual object-oriented classification to a functional-economic system, although a step in the right direction, is not enough. They believe that the conventional administrative budget is completely outmoded and propose its replacement by an entirely new approach to budget formulation and execution which they consider to be best suited to the needs of a modern government. The system of "program" and "performance" budgeting which they advocate stresses a government's ends and the progress made in achieving them rather than the means by which those ends are achieved. This method of budgeting focuses

"... attention upon the general character and relative importance of the work to be done, or upon the service to be rendered, rather than upon the things to be acquired such as personal services, supplies, equipment, and so on. These latter objects are, after all, only the means to an end. The all-important thing in budgeting is the work or service to be accomplished, and what that work or service will cost.

Albert Waterston is Advisor on Planning Organization for the Development Services Department of the International Bank for Reconstruction and Development.



Under performance budgeting, attention is centered on the function or activity -- on the accomplishment of the purpose -- instead of on lists of employees or authorization of purchases." (Yoingco, Angel Q., "Performance Budgeting for the Philippine Government")

This form of budgeting is alternatively called "program" budgeting (to emphasize its concern with programs instead of objects of expenditure), or "performance" budgeting (to emphasize its concern with accomplishments instead of means). In program and performance budgeting, both the government entities and the objects of expenditure are secondary. What is primary is that the data are detailed under specific programs in terms of workloads, units of work, and unit costs.

The distinguishing feature of program and performance budgeting is that it seeks, whenever possible, to measure the results achieved in physical or real, as well as in financial, terms. Thus, at the start of a budgetary period, a program and performance budget may show estimates of miles of roads to be leveled or paved, the number of teachers to be trained, additional number of students to attend schools, acres of land to be cultivated, irrigated or cleared, as well as the expected cost of each function, program, project, or activity. After the budgeting period has passed, a program and performance budget can show the actual achievement in each of these fields obtained from actual budgeting expenditures. When reporting and accounting systems are based on such breakdowns, they provide data on work accomplished and its costs, thereby enabling direct comparisons to be made with plan expenditure estimates originally approved in a budget.

A conventional budget with object headings is therefore a much more limited instrument than a performance budget for planning and other purposes. It does not supply physical measurements or comparisons. Even as a financial instrument, it is inadequate for planning because it does not relate what is bought with what is done. Since the object heading shows what government buys but not why, it does not reveal the nature of government programs or accomplishment under those programs. A budget which does not relate expenditures to specific programs and projects cannot easily be linked to a development plan which is couched in terms of programs and projects. This explains some of the difficulties encountered when attempts are made to implement a development plan through a budget classified by object. In contrast, as those who favor program budgeting quite correctly point out, program budgeting is "attuned to planning" because it has taken over

"... some of the main characteristics of a plan. The basic features of a plan are the use of programmes or projects as operational units, the emphasis on their physical inputs and results or benefits and on their cost in relation to benefits.



Cost-benefit analysis plays an important role in the selection of projects. These are also the attributes of a programme budget." (UN Inter-Regional Workshop on Problems of Budget Classification, Relationship Between Planning and Government Budgeting in Developing Countries)

There can be no doubt about the usefulness of the data which program budgeting seeks to develop. They are substantially like those which central planning agencies try to get operating organizations to produce and to supply in reports on the progress of program and project execution. Such information is essential for formulating well-conceived plans. The assignment of physical output targets and the use of unit costs for each program, project, and activity provide norms and yardsticks for efficient and timely implementation of plans. They also provide a basis for instilling in the personnel of operating organizations a greater sense of cost-consciousness and responsibility for adhering to work schedules.

Planners and budgeters are therefore likely to agree on the necessity for physical as well as financial accounting and reporting for programs, projects, and activities. They may, however, part company on the question of who should be responsible for collecting and evaluating these data. Whether a budget office or a central planning agency should perform these tasks is, of course, a political decision. But it is important that duplication of effort be avoided. The scarcity of talent in less developed countries would make such duplication too costly.

#### Difficulties Involved

Because of the great scarcity of trained accountants, economists, and planners in these countries, a question also arises whether current efforts to improve budgets which place primary emphasis on the introduction of program and performance budgeting constitute the best use of available technicians. In recent years, the United Nations and its regional economic commissions, as well as budget specialists from the United States (which first applied program and performance techniques to its 1951 Federal Budget), have made considerable efforts to get less developed countries to adopt program budgeting.

Largely as a result of these efforts, some less developed countries have adopted or have taken steps to adopt program budgeting. The best known example of the application of program budgeting techniques in a developing country is the Philippines, where the new techniques were initiated partially in the 1956 budget and more fully in the 1957 budget. Latin America has been particularly receptive to the new budgetary form. Reforms instituted in the early 1960s in the budgets of countries in the region, including Bolivia, Colombia, El Salvador, Honduras,

Paraguay, and Peru, and those still in progress in Argentina, Chile, Ecuador, and Venezuela and in Central American countries, reflect a desire to use program budgeting techniques. In Africa, program budgeting has been mainly attempted in Ghana and the United Arab Republic. Israel has used program budgeting procedures for capital outlays for several years and for current operations since 1961. Program budgeting has also been introduced to some extent in Iran and Thailand, and a start has been made in the Republic of Viet Nam.

However, the results obtained thus far indicate that it takes a long time before less developed countries can make effective use of these techniques. Few budget offices are adequately equipped with staffs qualified to perform these difficult and continuing tasks. In fact, in some countries, budget agencies and ministries of finance have not even had the capacity to change the budget presentation from an object to a functional or economic classification.

In recognition of this fact, program budgeting has been introduced in a few countries by authorities who were willing to start on a modest scale in an agency or two. But it is generally much more difficult to introduce budgetary innovations in operating organizations than in a central budget office. Those who favor the use of program budgets therefore tend to postpone tackling operating organizations and begin instead by introducing program budgeting in a central budget office.

Experience in the United States, the Philippines, and other countries where this general approach has been tried demonstrates that program budgeting cannot be grafted onto a government's administrative structure from above. The obstacles to installing the new system in ministries, departments, and agencies, which are found to be too difficult to surmount at first, generally remain insurmountable; and without operating organizations capable of providing accurate budgetary estimates and measurements of progress, most program budgeting procedures carried out by central budget offices are largely shadow without substance.

The incomplete implementation of program and performance budgeting in countries where it has been tried is partly due to its complexity. It attempts to do much more than conventional budgeting. It also requires that a government break with traditional concepts and methods of budget management. Furthermore, performance budgeting has also been slow in spreading after its introduction in most countries because of the scarcity of superior personnel, an effective public administration, and efficient procedures within operating organizations, as well as in a central budget office. Hence, although performance budgeting is conceptually superior to other budgetary systems, it is rarely much more effective because little is done to remedy underlying personnel, organizational, and procedural inadequacies which exist in all governments.

Small wonder, then, that the record of success has not been up to promise. In these circumstances, it is perhaps unfortunate that many countries have been made to feel that better budgeting and performance budgeting are synonymous. Performance budgeting has sometimes been represented as the remedy for most fiscal ills. But the truth is that, even at best, the adoption of performance budgeting cannot solve all budgetary problems. And where, as in most less developed countries, the situation is not propitious, innovation of performance budgeting may produce only the appearance, not the reality, of improvement. While the educational value of an effort to install performance budgeting may be applauded, it may have been carried out at a high "opportunity cost" by absorbing the time of scarce technicians who might have been put to better use elsewhere. It may also have had the effect of obscuring inability or unwillingness to undertake needed reforms or other action elsewhere.

Experience shows that there is no one budget system which meets the planning and other needs of all countries. The kind of budget which a country requires is determined not only by the objectives of the budgetary process but also by its institutional structure and stage of development. Thus, although the introduction of program and performance budgeting may be desirable for one country, it is by no means the only reform, or even the most immediate reform, needed in the budgeting of most countries engaged in development planning.

## THE RELATIONSHIP BETWEEN ECONOMIC DEVELOPMENT PLANNING AND BUDGETING

Faustino Sy-Changco

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These are  
excerpts  
from the  
paper.

Developing countries in Asia have lately concerned themselves with accelerated economic development from a predominantly agricultural economy to one where manufacturing industry expands side by side with and complements agriculture. Simultaneously, most of these countries have been improving their existing budget systems to make them more responsive to the requirements of their growing economies.

The Philippines has had experiences in both fields. Needless to say, it has encountered problems in the process of implementing its developmental program. It has exerted serious efforts to improve its budget system to provide an adequate fiscal machinery for carrying out government participation in the development program.

During the last decade, several economic development programs have been formulated, all of which were intended to give guidance in the search for economic prosperity and stability. The latest of these

Faustino Sy-Changco is Commissioner of the Budget, Republic of the Philippines.

is the Five-Year Integrated Socio-Economic Program (fiscal year 1963 -- fiscal year 1967). These programs may have differed in their approaches and emphasis in solving national economic problems but their basic aims are identical -- building up the national economy and promoting general welfare, using the nation's budget as one of the main vehicles to achieve these objectives. As in the past, the most challenging problem is how to provide the fiscal resources to translate these broad programs into specific projects.

It was estimated that, for the gross domestic product to grow at the rate of 6 percent compounded annually, new capital formation of ₱12.7 billion [ 3.9 pesos = 1 \$US] must be mobilized over the five fiscal years. Of this total amount, the government's share was placed at ₱2.7 billion or 22 percent of the total target. This is in addition to the annual current operating expenditures of the National Government.

The maximum estimated revenues of the government from existing taxes would not be able to meet all of its share of these financial requirements. It is proposed that the gap be financed either by public borrowing or the levying of additional taxes. But more than ever, this difficulty would also necessitate sound management in the allocation of scarce fiscal resources and their judicious use.

Under a democratic set-up of free enterprise, the government must muster all the effective tools of management to perform a dual role in the implementation of the Program, namely: 1) to provide the required basic facilities and services by directing and channeling its capital outlays to these ends, and 2) to influence the private sector's consumption pattern and investment by providing leadership, guidance, direction, and assistance.

It is obvious that the government can efficiently and effectively carry out this two-fold role only through a modern and sound system of management. It is a system that would approximate the same rigorous efficiency of private business ventures; a system that sets clearly defined objectives and targets, translates them into concrete plans for which necessary support for implementation as well as coordination is provided. It is a system that reviews performance and modifies plans in the light of work progress. In short, it is a system that provides the basic tools or techniques for planning, implementing, reporting, and reviewing.

#### Program and Performance Budgeting

Program and performance budgeting is a management process that permits the formulation of sound fiscal plans and the review of the adequacy of budget actions taken. By emphasizing the general character and relative importance of the work to be done, the service to be



rendered, the corresponding cost of the work or service, and establishing measures of work units, program and performance budgeting provides an intelligent basis for budget formulation, review, and control.

An outstanding feature of the present budget system in the Philippines is the methodical and considered formulation of government programs which require budgetary support. Considering the tremendous needs for public expenditures, budgetary efforts have been directed towards channeling the limited resources of the government to the best uses. This has been done through realistic fiscal planning.

Government programs and projects have been deliberately planned to achieve the objectives of the Five-Year Program. Fiscal policies have been formulated also in the context of the Program's goals and coordinated with other policies of the government. These have been made possible by adopting two sets of fiscal plans: the long-range and short-range fiscal plans.

Long-range fiscal planning has been adopted, realizing that economic and social development goals require programs and investments which must continually be undertaken for a number of years -- at least for the Five-Year Program period. Thus, it is necessary to project or make rough estimates of what the government should accomplish in a given period and what the corresponding fiscal costs are.

These projections provide the long-range framework of reference for short-range fiscal plans, while bridging the gap between annual government budgets and the socio-economic program. They provide the different branches of the government, as well as the general public, with an advance knowledge of the government's proposed plan of action.

Long-range plans also identify and specify the objectives of the government in terms of desirable work accomplishments. Under such plans, broad program and policy decisions are made which provide a basis for 1) establishing the framework of budgetary programs and projects and 2) developing organizational relationships and administrative policies. These have helped in providing continuity in operations between fiscal years or in the event there is a change of administrative leadership.

Short-range fiscal planning is normally confined to a single fiscal year. Needless to state, the financial estimates made for a coming fiscal year are on much firmer ground, more realistic and specific, compared to the rough projections of long-range planning.

Annual fiscal plans are developed initially for budget preparation purposes. At the bureau level, these must provide for 1) the nature of



work to be done (budgetary programs and projects); 2) the amount of work to be done; 3) the work schedules; 4) production and quality standards; 5) resources required in terms of personnel, supplies, equipment, facilities, etc., and 6) cost of resources required.

At the national level, the annual fiscal plan represents the limit of obligation estimates in the budget. In the allocation of fund resources to the various governmental programs, it represents the first means by which the Commissioner of the Budget, as the staff arm of the President with primary responsibility for financial management, exercises control over government expenditures. Most decisions affecting the annual fiscal plan are made during the budget preparation process and are therefore subject to change at higher review levels, particularly by Congress. Hence, the more significant measures for budgetary control occur during the budget execution phase, when work plans are implemented and money is spent.

To be realistic and effective, fiscal planning obviously requires revisions in the light of new conditions. Both long-run and short-run fiscal plans are, therefore, subject to modifications, most of which pertain to the annual plan. Aside from the changes in general economic and social factors, the following are examples of the circumstances which demand alterations in original plans: 1) increase or decrease of appropriations; 2) curtailment or rejection of proposals embodied in the budget; 3) new responsibilities which affect previous plans; 4) changes in estimating factors, such as price levels and the need for services not previously planned; 5) changes in program or work emphasis required by Congress or the President; and 6) inability to realize estimated revenues.

### Budgetary Control

Allotment system. The Commissioner of the Budget is responsible for controlling the implementation and faithful execution of fiscal plans. He must assure that expenditure proposals are in conformance, not only with the law and presidential policies, but with the over-all socioeconomic program as well.

Under the allotment system, the Budget Commission does five things relating to budgetary control:

- 1) It allots funds in accordance with planned levels of work to be accomplished;
- 2) It allots funds by program and project under three major classifications of expenditures, namely: personal services, maintenance and other operating expenses, and equipment;

- 3) It allots funds on a quarterly basis;
- 4) It may withhold allotment under specified conditions;
- 5) It approves transfers between allotments and modifications of agency financial and work plans when consistent with budget policies and legal limitations.

The first three functions above-mentioned constitute the bases from which performance and implementation start. The remaining two functions of the Budget Commission are the foundations upon which adjustment techniques are built.

Reporting system. Closely related to the efficient operation of the allotment system is the reporting or accounting system which must provide current information from the agencies on operations that are related to approved financial and work plans. It provides data needed in determining prospective allotment policies and amounts, and information showing the results of operations under previously authorized allotments.

The allotment process controls the release of funds for agency use. The reporting system is used to indicate the rates of income and obligation as well as the performance achieved by the agencies. The funds allotted thus serve as the basis for future allotments and such other actions as may be necessary to assure program control and revision, and budgetary direction.

Aside from the traditional accounting reports, the following reports must be submitted to the Budget Commission by government agencies:

- 1) The Estimate of Monthly Income, submitted prior to the beginning of the fiscal year. This projects income by month for the whole year and thus provides a standard with which to measure actual income subsequently reported each month, and a check on agency performance. When consolidated at the national level, the total of all agency projections serves as a guide in determining the permissible ceiling for the total of all allotments to be made to the agencies.

- 2) The Report of Income, prepared monthly by the agencies showing the actual income received for the month. This report shows any deviation from expected levels and indicates the source and cause of such deviation. The information thus provided serves as a basis for corrective action by the Budget Commission in adjusting allotments if the deviations from anticipated revenues warrant such action.

- 3) Report of Operations, which provides information on expenditures and work levels achieved. It is submitted monthly by the agencies

to the Budget Commission showing: actual expenditures, amount of work accomplished, and manpower used during the reported period of operation. These are compared with the established goals as shown in previously approved financial and work plans, and remedial action for deviation shown, if necessary, is taken.

Review system. Budgetary control is made more effective by two significant functions which the Budget Commission exercises under the allotment system. These are the following:

1) Withholding funds from allotment and reducing allotments already made are powers which the Budget Commissioner may exercise a) when income is less than amounts appropriated for expenditure or less than what was anticipated, and b) when he determines that funds are not needed by the using agency. The first is intended to prevent deficits and maintain at all times a balanced operating budget. The second is a measure against waste of public funds and is further necessary to provide for future contingencies and possible emergencies. The authority of the Budget Commissioner in this regard is an excellent control technique and helps stimulate improvement and economy in government.

2) Budget Commission approval of transfers between allotments and modification of agency plans provides the needed flexibility in the management and implementation of agency programs. Transfers of allotments within a project or from one project to another are approved by the Budget Commission when the accomplishment of program objectives can thereby be advanced. Transfers are approved as emergency measures. They are not encouraged because they destroy the integrity of the program amounts authorized.

### Strengthening Budget Organization

The adoption of performance budgeting required the revamping not only of agencies having to do with fiscal matters like the Budget Commission, the General Auditing Office, and the Bureau of the Treasury, but also of the entire National Government.

The role of the Budget Commission was broadened beyond purely ministerial functions to comprehend more complex and sophisticated duties. More concretely, its new activities include: fiscal planning and control in the management aspects of government operations, preparation, and control of the national budget; maintenance and preparation of consolidated accounting records and reports to the National Government; coordination of legislative proposals affecting financing and organization of departments and agencies of the government; and administration of the wage and position classification system.

Of great significance was the establishment of a fiscal policy staff as an integral part of the Budget Commission directly responsible to the Commissioner of the Budget. This staff unit is responsible for formulating sound and integrated short-range and long-range fiscal policies for accelerated social and economic development.

### Economic and Functional Classification

Since fiscal year 1956, government expenditures have been presented primarily on a functional basis, i. e., in terms of the major functions and programs of each agency harmonized and integrated into an over-all national economic long-range plan, and in terms of specific activities or projects under each of the primary programs. This classification is a means of clearly defining the work to be undertaken under each program and project, the physical resources needed to pursue the work, and the unit measure of cost.

Alongside the functional classification of expenditures by program and project, however, the old system of classifying by object class had to be maintained to meet the continuing need of both the executive and legislative branches for detailed information and to enable them to exercise more rigid item control.

This duality of classification of government expenditures under the functional basis of programs and projects and under the object basis of items of expenditures has given more comprehensive, understandable, and reliable information on what the government is doing, how much it is doing, and what the costs are, not only in financial but in physical terms as well, i. e., in terms of the actual resources or objects necessary to efficiently prosecute the functions of each of the different agencies.

Table I shows obligations of the Bureau by project and by object. It also shows the computation of personnel cost of land surveys.

In spite of the comprehensiveness of program and performance classification of expenditures, current requirements for information needed for fiscal analysis and policy formulation have shown the classification wanting. Attuned to satisfy public administration needs and fitted more into the context of long-range economic and fiscal plans, the classification could not provide needed data for analyzing the impact of government expenditures on short-term money supply and financial flows, on price levels and foreign exchange stability, and on other short-run economic effects of government transactions. A further reclassification of these accounts into their economic components was, therefore, necessary and the transitional link was provided by the old system of classification by object.

TABLE I. Department of Agriculture and Natural Resources, Bureau of Lands, Obligations in 1965

| A. OBLIGATION BY PROJECT                           |                                    | B. OBLIGATION BY OBJECT                  |                               |                                 |           |                       |
|--|------------------------------------|--|-------------------------------|---------------------------------|-----------|-----------------------|
|  | Estimate                           |  | Estimate                      |                                 |           |                       |
| Public Land Surveys                                | P 6, 096, 491                      | Salaries and Wages                       | P 7, 474, 899                 |                                 |           |                       |
| General Fund                                       | 5, 363, 323                        | Contributions for Employees'             |                               |                                 |           |                       |
| Public Land Survey and Subdivision                 |                                    | Retirement and Life Insurance            | 330, 224                      |                                 |           |                       |
| Bond Fund  | 733, 168                           | Traveling Expenses                       | 673, 000                      |                                 |           |                       |
| Cadastral Surveys                                  | - -                                | Communication Services                   | 30, 770                       |                                 |           |                       |
| General Fund                                       | 6, 965, 239                        | Transportation Services                  | 64, 650                       |                                 |           |                       |
| Bond Fund  | 1, 452, 027                        | Other Services                           | 6, 668, 739                   |                                 |           |                       |
| Cadastral Survey                                   | - -                                | Supplies and Materials                   | 589, 783                      |                                 |           |                       |
| Special Cadastral Revolving Fund                   | 513, 212                           | Rents                                    | 332, 890                      |                                 |           |                       |
| Verification of Surveys                            | 5, 000, 000                        | Amortization and Interest                | - -                           |                                 |           |                       |
| General Fund                                       | 1, 964, 587                        | Equipment Outlays                        | 59, 945                       |                                 |           |                       |
| Public Land Survey and Subdivision                 | 1, 701, 145                        |  |                               |                                 |           |                       |
| Cadastral Survey                                   | 176, 722                           |  |                               |                                 |           |                       |
| Geodetic Control Surveys                           | 86, 720                            |  |                               |                                 |           |                       |
| Reconstruction of Maps & Plans                     | 680, 508                           |  |                               |                                 |           |                       |
| General Fund                                       | 518, 075                           |  |                               |                                 |           |                       |
| Public Land Survey and Subdivision                 | 377, 701                           |  |                               |                                 |           |                       |
| Cadastral Survey                                   | 122, 453                           |  |                               |                                 |           |                       |
|  | 17, 921                            |  |                               |                                 |           |                       |
| TOTAL  | P16, 224, 900                      |  | P16, 224, 900                 |                                 |           |                       |
| C. PUBLIC LAND SURVEYS; PERSONNEL WORK MEASUREMENT |                                    |  |                               |                                 |           |                       |
| Unit of Work Measurement                           | Units of Backlog Beginning of Year | Total Work Units on Hand During the Year | Total Work Units Accomplished | Rate of Production Per Man-Year | Man-Years | Cost Per Unit of Work |
| Hectares Surveyed                                  | - -                                | 367 480                                  | 367, 480                      | 170                             | 2, 168    | P16. 59               |

The functional-economic classification of the Philippine National Government expenditures follows more or less the pattern of classification illustrated in the Manual for Economic and Functional Classification of the United Nations.



## DISGUISED UNEMPLOYMENT?

### DISGUISED UNEMPLOYMENT IN AGRICULTURE: A SURVEY

Charles H. C. Kao, Kurt R. Anschel,  
and Carl K. Eicher

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These are  
excerpts  
from a  
chapter of  
the book.

One of the recurring concepts in the postwar economic development literature is that of disguised unemployment -- that is, the case in which the marginal product of labor is zero or negative. Although much has been written about this topic, the literature is widely scattered and often inaccessible.

#### Disguised Unemployment in Historical Perspective

Joan Robinson coined the words "disguised unemployment" in 1936 to describe workers in developed countries who accepted inferior occupations as a result of being laid off from industries suffering from a lack of effective demand. She was referring to workers having a low rather than a zero marginal product of labor.

Charles H. C. Kao is Professor of Economics at Wisconsin State University, River Falls.  
Kurt R. Anschel is Professor of Agricultural Economics, University of Kentucky, Lexington,  
and Carl K. Eicher is Director of the Economic Development Institute at the University of Nigeria, Enugu, and Professor of Economics at Michigan State University, East Lansing.

Studies by Buck, Warriner, and Rosenstein-Rodan in the 1930s and 1940s in less developed countries presented statistical data to suggest that a large percentage of agricultural labor was idle for substantial periods of the year. [For references in this section, see pp. 92-93.] Buck collected data on over 15,000 farms in China which revealed that only 35 percent of the men between 15 and 60 years of age had full-time jobs. Buck's labor utilization approach, of course, did not reveal anything about the marginal product of labor. Doreen Warriner followed in 1939 with a widely quoted study which revealed that in "Eastern Europe as a whole, one-quarter to one-third of the farm population is surplus..." Rosenstein-Rodan wrote that 20 to 25 million of the 100 to 110 million people in Eastern and Southeastern Europe were either wholly or partially unemployed. In 1945, Mandelbaum estimated that from 20 to 27 percent of the active rural workers in Greece, Yugoslavia, Poland, Hungary, Rumania, and Bulgaria were redundant; he presented a "mechanical" model of planned industrialization to absorb the surplus labor within one generation. The studies cited so far all are widely mentioned as support for the existence of disguised unemployment in agriculture. In fact, the widely quoted 1951 United Nations report by a group of experts including W. Arthur Lewis, T. W. Schultz, and D. R. Gadgil cited these studies and added that it seems "safe to assume that for many regions of India and Pakistan, and for certain parts of the Philippines and Indonesia, the surplus [rural population] cannot be less than the pre-war average for the East European Region."

The presence or absence of disguised unemployment is partly an issue of definition. While the writers mentioned above accept a zero marginal product of labor, other conditions being equal, Navarrete and Navarrete in a 1951 article included the introduction of some capital into production in their definition of underemployment. Obviously, the greater the reorganization of agriculture and the greater the introduction of capital, the larger the volume of workers who can be transferred out of agriculture without affecting agricultural output.

In 1953, Nurkse introduced a theory of economic development on the assumption that disguised unemployment was present over a wide portion of Asia. Nurkse stated that development could be initiated and accelerated in these countries by forming capital through the employment of redundant rural labor. Farm output does not fall, in the Nurkse schema, when workers are shifted to non-farm tasks, because he relaxes the assumptions slightly to permit better organization through "consolidation of scattered strips and plots of land." The Egyptian economist Koestner was among the first to criticize the disguised unemployment doctrine when, in 1953, he strongly criticized Nurkse's position.

Lewis presented another version of disguised unemployment in 1954, when he introduced a model of capital formation and development

in which the capitalist sector grew by drawing on cheap rural labor without any significant reduction in agricultural output. Next, Eckaus explained the existence of disguised unemployment by limited technical substitutability of factors of production in agriculture.

Concentrated opposition to disguised unemployment came from Warriner in 1955 and Schultz in 1955 and 1956. Warriner reversed her earlier position in Land and Poverty in the Middle East, in which she showed that 50 percent of the Egyptian rural population was surplus, by noting that she had omitted the labor requirement for capital maintenance in agriculture. Schultz wrote that "all too much attention is being directed to taking up the existing slack in countries that now have a poor collection of resources on the assumption that there are many underemployed resources readily available for economic growth." While Schultz cited examples in Latin American countries where the removal of agricultural labor resulted in a decline in agricultural output, he argued on a broader scale and wrote, "I know of no evidence for any poor country anywhere that would even suggest that a transfer of some small fraction, say 5 percent, of the existing labor force out of agriculture, with other things equal, could be made without reducing its [agricultural] production." Viner was the next strong opponent of disguised unemployment. Writing in 1957, he criticized writers such as Eckaus who contended that disguised unemployment could exist in agriculture because of limited technical substitutability of factors of production. In an unpublished dissertation in 1957, Kenadjian reviewed a wide range of studies of disguised unemployment and concluded

"... that almost invariably the estimates of surplus labor have been inflated and the opinions about the extent of redundancy in a particular country have contained elements of gross exaggeration in all the countries about which quantitative information can be found to any significant extent. In particular, assertions that disguised unemployment exists in proportions as high as 25 to 30 percent of the labor force in any sector of the economy of even the most overpopulated countries of the world appear to be entirely without foundation."

Haberler joined the attack in 1957 and 1959 and criticized disguised unemployment, basing his reasoning on the propositions earlier advanced by Schultz and Viner.

### Empirical Studies of Disguised Unemployment

Generally speaking, two methods are available to measure disguised unemployment. The first is the direct method, which is based upon a sample survey. This method uses the labor utilization and the labor productivity approaches. The labor utilization approach presents an inventory of what labor is used in the field or in other farm tasks as

a percentage of the available supply. The labor productivity approach goes a step further and examines the relationship between the quantity of labor used and/or available and the level of production. The indirect method, which relies on secondary data, is the second method of measuring disguised unemployment.

Mellor and Stevens undertook a study of the average and marginal product of farm labor in Thailand, which was based on labor-income records obtained by personal interviews in 104 rice farms at Bang Chan, Thailand, and published in 1956. "Labor that is available for farm work but is doing no work is counted as part of labor input. Labor that is actually on the field but contributing no increment in output through its efforts is not treated differently from labor that is not working but is available for such work." They concluded that disguised unemployment existed in this area. More recently, Mellor commented on this village study and stated that the data were inadequate for more than rough approximation of disguised unemployment.

Harry T. Oshima, commenting recently on the Mellor and Stevens' study, stated, "I feel it is hazardous to regard this study as conclusive for either theoretical or policy use. The spread of the data suggests to me inadequate data and/or dubious assumptions."

In a recent book, Mujumdar studies two facets of underemployment in agriculture, namely, disguised and seasonal unemployment. Attention here is given to the empirical results of disguised unemployment.

Field investigation covering three months in 1954-55 was conducted in nine selected villages of the Bombay Karnatak region to measure the degree of disguised unemployment. The author interviewed village officers and studied village records to determine the population, occupations, land use, number of livestock, labor movements, work schedule, and standard cultivated holdings in each village. Also, 25 families in each village were intensively interviewed to determine family size, occupation, sources of income, size of holdings, and annual work schedule.

Mujumdar finds in his nine-village study of small farmers that "roughly about 71 percent of the farmers are affected by disguised unemployment." Thus, this figure, "in spite of all the limitation, present[s] in concrete terms the alarming proportions which the phenomenon of disguised unemployment has assumed."

There are at least three shortcomings of Mujumdar's methodology. First, the standard holding is essentially an arbitrary unit. Second, Mujumdar makes no special attempt to quantify the labor input and

include it in his analysis. He assumes that all farms are using the most labor-intensive techniques available. Yet, this, he admits, is not true of India. Third, Mujumdar, like many other economists, fails to relate his empirical definition to his theoretical definition of disguised unemployment. Using the standard holding rather than the marginal productivity technique, Mujumdar arrives at the dubious conclusion that more than 70 percent of the agricultural population could be removed from the region without lowering production.

In 1957, Rosenstein-Rodan wrote that it was his firm belief that disguised unemployment of more than 5 percent exists in many -- though not all -- underdeveloped countries; he supported this belief by measuring disguised unemployment in southern Italy.

Rosenstein-Rodan found that "more than 10 percent of the active labor force in southern Italian agriculture is surplus..." Later, however, Kenadjian discussed this matter with Rosenstein-Rodan and reported, "When Rosenstein-Rodan observes that in southern Italy around 10 to 12 percent of the actual population in agriculture are removable, he is including among the removable surplus the individuals who are needed for 50 days or less. If the more rigid definition, which is also the more sensible one, is adopted, the removable surplus is reduced to 5 percent."

This clearly illustrates that a careful appraisal of the definition is necessary before one so blindly accepts an author's statement that 10, 20, or 70 percent of the labor is redundant in agriculture.

T. W. Schultz supported the validity of the disguised unemployment concept in the United Nations report in 1951 and later rejected the existence of disguised unemployment in publications in 1956. In his recently published book, he reinforced this position by turning to the influenza epidemic of 1918-1919 in India to test the hypothesis that the marginal product of a part of the labor force in agriculture was zero. This incident was used because the epidemic struck suddenly; the death rate reached a peak within weeks and then diminished rapidly. Those who survived were not debilitated for very long. Schultz estimated the existence of disguised unemployment by comparing the reduction in acreage sown with the reduction in the labor force. Such a comparison assumes that, if any disguised unemployment exists, the acreage sown will not be reduced as a result of a sudden reduction in the labor force. Schultz found that the agricultural labor force in India was reduced by about 9 percent, while,

"The area sown in 1919-20 was, however, 10 million acres below, or 3.8 percent less than that of the base year 1916-17. In general, the provinces of India that had the highest death rates attributed to the epidemic also had the largest percentage



decline in acreage sown to crops. It would be hard to find any support in these data for the doctrine that a part of the labor force in agriculture in India at the time of the epidemic had a marginal product of zero."

Pepelasis and Yotopoulos recently published a macro-level study which was designed to measure the volume of removable surplus labor as well as that seasonal surplus labor in Greek agriculture for the period from 1953 to 1960. Removable (chronic) surplus labor was defined as the amount of labor which could be removed for at least one year without any change in the quantities of other factors of production and without leading to any reduction in output. The authors measured surplus labor by comparing the labor available with the labor required for a given volume of output within the agriculture sector. The indirect method, using secondary data, was employed to derive estimates of labor availability and labor requirements.

The authors found that "chronic surplus labor in Greek agriculture is virtually nonexistent. From the eight years of our series, it existed only in 1953 and 1954 to a degree of 3.5 and 2.3 respectively. The other years of the period are marked by a seasonal shortage of labor."

### Summary

We have pointed out that the existence of disguised unemployment is largely a matter of definition and the assumptions about the institutional forces involved. Nevertheless, some writers agreed upon the zero-product-of-labor definition in the early 1950s, and it is an understatement to say that the development literature in this period was optimistic about development through the transfer of redundant agricultural labor to other occupations. We have shown that the empirical studies supporting this optimism were often poorly conceived. In addition, we have noted that by considering temporary rather than permanent labor transfers and by allowing some reorganization of production, various writers have arrived at a high percentage of disguised unemployment. To date, there is little reliable empirical evidence to support the existence of more than token -- 5 percent -- disguised unemployment in underdeveloped countries as defined by a zero marginal product of labor, other conditions being equal.

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## SURPLUS AGRICULTURAL LABOR AND DEVELOPMENT: FACTS AND THEORIES

Morton Paglin

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from the  
article.

This article reviews several strategic assumptions regarding labor productivity and unemployment in the context of economic development theories and tests these assumptions against some recently available statistical data. The results described below contradict some fundamental conclusions derived from models using the concept of surplus labor and disguised unemployment, and indicate the need for a more thorough use of available statistics in the analysis of development problems.

The focus of the discussion is Indian agriculture, which is frequently cited as a classic case of disguised unemployment. The data are largely drawn from the extensive, 17-volume Farm Management Studies of Indian agriculture, which covered the six main agricultural regions of India on a sample basis, but in considerable depth. Since the data are at variance with a few previous studies on labor productivity in underdeveloped areas by Mellor and Stevens, Moore, the UN, and Warriner, it is important to note that the Farm Management Studies data were not based on a small local survey, but involved 2,962 holdings covering the major crops grown in India. A large number of specially trained field inspectors

Morton Paglin is Professor  
of Economics, Portland State  
College (Oregon).

observed farm operations in the sample districts and prepared cost-accounting records for the farms on a regular, almost daily, basis for a three-year period. In scope and refinement, the Farm Management Studies easily surpass all previous field studies of the economics of peasant agriculture.

What light does this material throw on the question of surplus agricultural labor and population? If surplus labor is interpreted to mean either 1) labor working, but not adding to output (disguised unemployment), or 2) labor chronically unemployed, which labor (in both categories) could be removed for a whole year without affecting output, then the data show that there is no significant surplus of labor for Indian agriculture as a whole.

No major reorganization of agriculture is considered to accompany the removal of labor. The movement of labor out of agriculture rather than shifts within agriculture is the typical policy implication. In fact, it is generally believed that rational shifting and reorganization of the labor force within agriculture would generate a still larger surplus of labor. This paper attempts to show that large-scale opportunities for additional employment exist within agriculture, and that the output of the current labor force could be increased by redistribution of labor within the sector. Chronic or disguised unemployment of family labor, presumably because of small landholdings, will also be called into question as a generalization applicable to farms in the smaller size classes. Finally, the common assumption that economic development will produce a large exodus of labor from agriculture is shown to be in need of drastic revision.

#### Farm Size and Output per Acre

One of the most surprising results of the Farm Management Studies is the relationship found between farm size and output per acre. In a large proportion of the districts, and for most crops, output per acre declined with increasing farm size. This is shown in Table I where value of agricultural output (in rupees), classified by size of holdings, is presented for five states.

It is difficult to avoid coming to the conclusion that the larger farms in India (over 10 acres) are markedly underutilized in terms of economically feasible levels of intensity of cultivation. The average yield per acre on these large farms is consistently below the yield of small farms. The reasons for this will be examined in a moment, but here it may be noted that in this underutilized resource there is an unexpected safety valve for, as population increases and the average size of holding goes down, output per acre can be expected to increase, insofar as the poorer yield per acre of the large holdings is attributable to low motivation and lower labor inputs rather than to land of lesser intrinsic fertility.

Table I. Average Input and Output Per Acre by Size of Farm (Rupees)

| West Bengal<br>1955-6     |            |             | Madras<br>1955-6 |            | Madhya Pradesh<br>1956-7 |                |            | Uttar Pradesh<br>1955-6 |                |            | Punjab<br>1955-6 |                |            |             |
|---------------------------|------------|-------------|------------------|------------|--------------------------|----------------|------------|-------------------------|----------------|------------|------------------|----------------|------------|-------------|
| Size-<br>group<br>(acres) | In-<br>put | Out-<br>put | Size-<br>group   | In-<br>put | Out-<br>put              | Size-<br>group | In-<br>put | Out-<br>put             | Size-<br>group | In-<br>put | Out-<br>put      | Size-<br>group | In-<br>put | Out-<br>put |
| 0.01-<br>1.25             | 186.5      | 202.1       | 0-2.5            | 291.8      | 219.9                    | 0-5            | 99.9       | 143.3                   | 0-5            | 259        | 277              | 0-5            | 219.4      | 176.5       |
| 1.26-<br>2.50             | 159.2      | 194.8       | 2.5-5.0          | 174.8      | 205.2                    | 5-10           | 87.8       | 115.1                   | 5-10           | 209        | 240              | 5-10           | 181.3      | 170.5       |
| 2.51-<br>3.75             | 178.1      | 175.9       | 5.0-7.5          | 140.4      | 157.4                    | 10-15          | 86.3       | 118.9                   | 10-15          | 185        | 204              | 10-20          | 178.6      | 169.8       |
| 3.76-<br>5.00             | 146.9      | 181.0       | 7.5-10           | 137.9      | 134.8                    | 15-20          | 76.5       | 98.5                    | 15-20          | 173        | 200              | 20-50          | 138.0      | 142.6       |
| 5.01-<br>7.50             | 152.8      | 186.9       | 10-15            | 93.2       | 76.8                     | 20-30          | 72.4       | 107.9                   | 20+            | 145        | 205              | 50+            | 131.1      | 159.6       |
| 7.51-<br>10.00            | 136.2      | 172.0       | 15-20            | 72.9       | 67.7                     | 30-40          | 75.1       | 106.1                   |                |            |                  |                |            |             |
| 10.01-<br>15.00           | 98.2       | 149.1       | 20-25            | 74.4       | 73.3                     | 40-50          | 82.0       | 98.7                    |                |            |                  |                |            |             |
| 15.01+                    | 116.3      | 141.9       | 25+              | 61.0       | 82.4                     | 50+            | 77.8       | 107.3                   |                |            |                  |                |            |             |
| Ave.                      | 151.2      | 178.1       | Ave.             | 113.4      | 118.3                    | Ave.           | 78.5       | 107.8                   | Ave.           | 185        | 220              | Ave.           | 156.0      | 153.3       |

Source: Farm Management Studies

Differences in yield can be accounted for without introducing fertility as a variable. Differences in labor and material inputs per acre explain a large percent of the variance in yield. Willingness to use additional inputs, rather than intrinsic differences of soil quality, seem to be mainly responsible for the observed results. In Table II, below, further evidence of the inverse relationship between farm size and intensity of cultivation is offered: labor inputs per acre show more labor per acre on the small farms.

In Table I, total inputs per acre include all cash outlays for hired labor, depreciation of equipment and the imputed value of family labor, and rent (which isn't a cash outlay for a large majority of farmers). Therefore, the difference between input and output represents entrepreneurial profit per acre.

The input figures establish the inverse relationship between farm size and the intensity of cultivation, and indicate that higher outputs per acre generally result from higher inputs. Hence, the smaller farms average higher inputs and outputs per acre than the larger farms. The small farms make up for their structural weakness, fragmentation, lack of credit, etc., by intensive application of family labor and more inputs of complementary factors.

#### Input-Output Functions and "Surplus" Labor

The input-output data for 1,096 sample holdings in all five states have been plotted in Figure I. Inputs accounted for 91 percent of the variation in output. It should be recalled that cost data contain a full and careful estimate of all imputed family labor, valued at the market wage. This constituted a sizeable percent of the inputs and, if the marginal productivity of a large segment of family labor were zero, as has been claimed, it is doubtful that so high a correlation between inputs and outputs would have resulted. In fact, the supposed lack of correlation between inputs and outputs

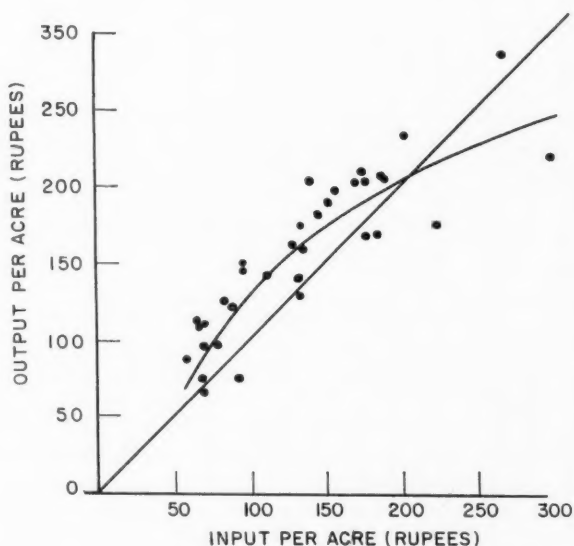


Figure I. INPUT-OUTPUT FUNCTION

per acre in some earlier, very limited studies was used as the basis for an extensive literature assuming an absolute surplus of agricultural labor with zero marginal productivity.

The difference between the regression curve and the 45° straight line represents profit per acre. A significant percentage of farms failed to cover all the imputed costs. However, it is of interest to note that less intensively cultivated large farms fell into this category as well as highly intensive small units. In practice, many of the farms which failed to cover cost fully can and do remain in operation because imputed costs do not have to be paid out (most Indian farmers own their own land) and the total family income from all sources is enough to cover the necessities of life.

Let us now examine the possibility that a significant part of the labor inputs used have zero marginal product. The disguised unemployment assumption requires that the least productive workers be removed from agriculture with no noticeable effect on output. Where are such workers likely to be found? Probably not on the medium and large farms because these farms have relatively low labor inputs and, furthermore, hire a sizeable percent of the labor used. Disguised unemployment is typically suspected on the small farms which have high inputs of labor per acre and depend more heavily on family labor. From the data presented in Table I, it is clear that more intensive cultivation via increased doses of capital and labor on these small farms results in additional output.

Those who postulate a large surplus of labor with zero productivity must argue that the same increase in output per acre would occur with a significant portion of the labor on the small farms removed. Now, if the proportion of labor to capital inputs on the small farms were very high compared with the proportion found on the larger farms, then the disguised unemployment thesis might receive some encouragement. But in general, the studies showed that each unit of labor on the small farms has more material inputs to work with than a unit of labor on the larger farms. In general, on the small farms, land-saving techniques have resulted in a substitution of capital and labor for land, but the evidence indicates that labor has not been extensively substituted for capital. The small farmers use more bullock labor, fertilizer, and irrigation inputs per acre, as well as more family labor. Given the basic similarity of agricultural techniques on the large and small farms, it should be clear that the labor on the small farms is just as essential as the labor on the large ones. Hence, there is little reason to believe that the higher labor inputs on the small farms represent disguised unemployment.

Another common variation of the disguised unemployment thesis runs as follows: the typical Indian landholding is so small that there

is not sufficient land to employ the family workers productively. Hence, chronic underemployment or hidden (disguised) unemployment is the result. The supposed lack of work possibilities outside the family farm is, of course, crucial to the argument, yet available statistics show that the extent of outside work is quite considerable in many areas.

The data presented in Table II throw further doubt on the generalization of disguised unemployment. Here we have inputs of total labor per acre (family and hired) and percent hired, by size of holding. It can be seen that even the farms in the smallest grouping use a significant percent of hired labor, though as expected, a smaller percentage than the larger farms. Apparently then, for the smallest group as a whole, the marginal product of family labor must be positive. Otherwise, it would make no sense to hire outside workers. Most economists would interpret the existence of hired labor as proof, per se, that disguised unemployment was not present. Hired labor adds considerably to output, and the employer hires this labor not because of social pressure, but because it is profitable. The problem which must be explained in terms not adequately described by the competitive market mechanism is why the large farmers do not hire more labor when it would increase profits to do so.

#### How Additional Labor Could Be Productively Used

Let us consider the potential productivity of additional labor inputs. These inputs should be added where their marginal productivity would be the highest, namely on the large farms which seem to use too little labor per acre to achieve optimum results. Of course, it may be objected that the additional workers would require more inputs of the complementary factors, and that a dearth of the latter may be the reason why the larger farms are underutilized. However, credit open to the larger farmers is certainly superior to that of the small farmers who cultivate so much more intensively.

As to the supply of factors, one of the most important complementary inputs is irrigation, and the disappointing utilization of major irrigation projects, frequently even when the government offers the water free for the first three years, should create doubt as to whether the limitation is lack of associated inputs. About 25 percent of the available irrigation potential is currently wasted. The farmer has to dig the field channels to utilize the water, but this just requires labor, which is supposedly the factor in surplus.

However, even assuming that no additional capital inputs are available, a strong case can be made that some additions to the labor force could be productively employed, and there is little doubt that removal of a sizeable number of agricultural workers would result in a significant



Table II. Classification of Total Labor Inputs Per Acre and Percent Hired, 1955-56  
(Labor input in days or value terms as indicated)

| Uttar Pradesh      |                             |                | Madras                        |                |                    | Bombay                        |                |                    | Madhya Pradesh                |                |                    | Punjab                        |                |                    |
|--------------------|-----------------------------|----------------|-------------------------------|----------------|--------------------|-------------------------------|----------------|--------------------|-------------------------------|----------------|--------------------|-------------------------------|----------------|--------------------|
| Size-group (acres) | Total Labor Per Acre (days) | Per-cent Hired | Total Labor Per Acre (rupees) | Per-cent Hired | Size-group (acres) | Total Labor Per Acre (rupees) | Per-cent Hired | Size-group (acres) | Total Labor Per Acre (rupees) | Per-cent Hired | Size-group (acres) | Total Labor Per Acre (rupees) | Per-cent Hired | Size-group (acres) |
| 0-2.5              | 58.6                        | 11             | 69.4                          | 30             | 0-5                | 42.63                         | 19             | 0-5                | 32.29                         | 57             | 0-5                | 53.13                         | 20             | 0-5                |
| 2.5-5.0            | 63.5                        | 10             | 32.8                          | 53             | 5-10               | 30.86                         | 15             | 5-10               | 27.57                         | 52             | 5-10               | 51.22                         | 16             | 5-10               |
| 5.0-7.5            | 62.4                        | 18             | 26.1                          | 36             | 10-15              | 24.64                         | 20             | 10-15              | 25.72                         | 55             | 10-20              | 46.96                         | 28             | 10-20              |
| 7.5-10             | 53.2                        | 20             | 22.0                          | 40             | 15-20              | 34.42                         | 53             | 15-20              | 23.68                         | 51             | 20-50              | 34.16                         | 39             | 20-50              |
| 10-15              | 50.2                        | 29             | 15.4                          | 47             | 20-25              | 15.32                         | 17             | 20-30              | 21.58                         | 66             | 50+                | 35.13                         | 76             | 50+                |
| 15-20              | 45.3                        | 36             | 12.9                          | 37             | 25-30              | 15.88                         | 44             | 30-40              | 22.73                         | 62             |                    |                               |                |                    |
| 20-25              | 42.4                        | 34             | 15.3                          | 36             | 30-50              | 26.14                         | 50             | 40-50              | 26.70                         | 81             |                    |                               |                |                    |
| 25+                | 36.7                        | 49             | 11.4                          | 40             | 50+                | 10.95                         | 33             | 50+                | 22.74                         | 88             |                    |                               |                |                    |
| Ave.               | 47.1                        | 28             | 21.0                          | 37             | Ave.               | 21.13                         | 36             | Ave.               | 23.75                         | 71             | Ave.               | 44.12                         | 36             | Ave.               |

Source: Farm Management Studies

decrease in output. The Farm Management Studies computed production functions for specific crops in sample districts; the marginal product of labor was clearly positive. This evidence is further supported by the field reports, which point to the considerable opportunities for productive application of more labor. While additional labor inputs are usually accompanied by other complementary inputs, there is much room for use of labor without capital. Mellor and Moorti, in a field study in Uttar Pradesh, found that "differences in yields (per acre) seem to be largely due to differences in the use of the fixed, low-opportunity-cost inputs, in particular, family labour..." Examples abound in which additional labor can be used effectively.

The true Japanese paddy method, now gradually being introduced into India, requires much more labor per acre than most Indian rice farmers presently use. Planting and transplanting the seedlings in rows is a highly labor-intensive activity which pays off in terms of greatly expanded output. While a small labor force can harvest a given area of paddy in a longer than optimum time (say 30 days), the quality and quantity collected will be inferior to a harvest carried out by a larger work force in a 15-day period. Weeding is a very important factor in getting a good jute crop and this involves nothing but labor.

#### Indian Farmer's Work Year Is Not Short

Apart from the obvious intensive employment of all available labor in the peak periods, the seasonal idleness, commonly assumed to be so much in evidence, is markedly overdrawn. Coale and Hoover not only write of large absolute surpluses of labor (in terms of man-years), but state that the Indian farmer works for only three months out of the year. This is effectively refuted by the data from the Farm Management Studies which indicate considerably greater year-round employment than is usually believed. By Western standards of a full work year (260 days), the average Indian agricultural employment year appears reasonable. For the sample data, the range was from 266.5 days for West Bengal to 328.9 days in Nasik (Bombay State). This applied to all adult male farm workers, both family operators and hired laborers. A work day was defined as equal to eight hours of labor. Hence work days may exceed calendar days in the month.

Finally, there is a concept of surplus labor based on work units rather than workers. Leibenstein, in developing this point of view, reasons that if workers in an underdeveloped economy are given a higher wage and an improved diet, their level of health and efficiency would improve. Fewer workers could then perform the same tasks previously undertaken by the larger, less vigorous work force and produce the same output as before. The workers who could, under these conditions, be disposed of without reducing output are then considered "surplus" labor. However, it makes sense to refer to these workers

as surplus only if there is no productive employment for them. The above definition assumes this by postulating a given amount of useful work to be done and no more. As we have seen from the data presented, this is far from the truth, at least for India. If the ceteris paribus conditions are removed and it is assumed that the laborers and cultivators become healthier and more energetic, it seems reasonable to postulate a corresponding improvement in incentives. More intensive cultivation of the larger farms, use of available irrigation potential, and a shift to better seeds and methods -- all easily possible within the framework of small-holding, peasant agriculture -- would result in large additional demands for labor. In this case, the greater number of work units associated with the more energetic labor force would be used to enlarge total output, thus negating the surplus labor hypothesis.

### Why Land Is Underutilized

Why is there underutilization of land on many of the larger holdings? The field reports are particularly revealing. Time and again they indicate the disappointing performance of the larger farms: their reluctance to hire outside labor in sufficient quantity to produce satisfactory yields, and their lack of interest in utilizing irrigation water as a regular input to raise the intensity of cultivation, rather than as a stopgap measure in times of drought. Since the farmer with a relatively large holding can eke out a moderate income without the trouble of hiring a high percent of nonfamily labor or the risk of borrowing additional working capital for other inputs associated with intensive cultivation, he frequently seems to prefer the low-effort, low-risk, low-output package to the higher-risk, higher-profit, higher-output combination.

A theoretical explanation in terms of a low-aspiration model has been suggested by Mellor, and a revealing description of the range of attitudes toward work and profits found among Indian farmers is contained in the work of Kusum Nair. The reasons for the poor utilization of some of the larger holdings need not be further elaborated here, but the implications for labor-force utilization are worth noting: limited incentives in many areas of Indian agriculture, not a critical man-land ratio, may be the more important bottleneck to increased production and employment. However, insofar as population growth leads to smaller average holdings through a breakup of the larger holdings, and to the extent that current government land policies produce a more equitable distribution of land, the bottleneck is relaxed and a safety valve, effective at least in the short run, is brought into play. It is true that many dwarf farms are below optimum size and would benefit from a program of consolidation. However, it is also true, and usually unrecognized, that many of the larger farms (above 10 or 15 acres) are too large for optimum results, given the prevailing technology and incentives.

The potential effect of more intensive cultivation of the larger farms on total output can be realized by looking at the distribution of land holdings: farms of 10 acres and over constitute about two-thirds of the total farm land and are operated by 15 percent of the cultivators, but these large farms yield much less per acre than the smaller holdings. In the five states cited in Table I, the small and medium farms averaged about one-third more output per acre than the farms above 10 or 15 acres. The large farms constitute a source of unexploited land resources that can eventually be used (along with unused irrigation water) to expand agricultural output and provide additional employment. Currently, shifts of labor from the very small farms below 2.5 acres to farms of over 10 acres (e. g., in Madras) would result in higher total output. Increasing returns to labor are still present in some areas of agriculture. The Indian Government recognizes this and is attempting to transfer population to parts of Madhya Pradesh and Mysore in order to foster economic development -- a policy which would be difficult to explain in terms of most of the development models usually applied to India. It is equally difficult to reconcile the above findings with the often repeated remark that Indian agriculture is so oversaturated with labor that the marginal productivity of additional workers must be zero.

How far can increased intensity of cultivation go to offset the growth of the agricultural work-force? Will a further reduction in the size of holdings, brought on by population growth, necessarily be critical? If Japan, which has poor soils, small fragmented holdings, and a peasant agriculture, is compared with India, we get a rough idea of what might be feasible in India. The average holding in Japan is 2 acres, compared with India's 5.4 acres, and Japan has far less cultivated land per farm worker. Yet Japan obtains higher yields per man, and three to four times as much output per acre (in wheat and rice) as India. The comparison serves to point up the fact that India's land resources need not be considered the main barrier to increased agricultural employment.

#### Agriculture's Share of the Labor Force

So much intellectual capital has been invested in models which postulate surplus labor in agriculture available without social cost to the industrial sector that the growing evidence against this hypothesis has been largely neglected. Yet a good case can be made for the proposition that agriculture in the next decade will absorb and use productively almost its full share of the expected increase in the labor force.

From 1951 to 1961, the population of India increased by 21.5 percent while the labor force employed in agriculture increased by 33 percent due to higher labor-force participation rates, especially of women.

Despite a supposedly stagnant agriculture, an approximate 33 percent increase in the labor force was accompanied by an increase in agricultural production of 46 percent. For the decade, per capita agricultural output went up 20 percent. If one takes seriously the descriptions of huge surpluses of idle labor existing in Indian agriculture in the 1940s and 1950s, and the standard explanations that rationalization and improvement of techniques will create no new jobs in agriculture, and will eliminate many old ones, it would seem quite difficult to explain the statistical data of the past decade.

### Implications for Development Models

The data reviewed above throw doubt on the validity of the dual-economy models which assume a free transfer of labor from agriculture to industry without loss of agricultural product. The evidence also negates those formulas which suggest a maximization of output via the maximization of the average productivity of capital, since these prescriptions typically assume that labor is so plentiful as to be redundant even after the most labor-intensive known production functions have been utilized. Indian agriculture has a long way to go before arriving at this outer limit of the most labor-intensive production function. The Japanese experience and the Indian cross-section data indicate that Indian agriculture can, and probably will, move in the direction of a more labor-intensive production function for some time to come. Japanese rice-growers, for example, currently have a higher proportion of labor costs to total costs than the less developed, lower-output Indian farms, and it is the Japanese paddy method and similar improvements that are being extended in India.

To point out the growing employment possibilities in Indian agriculture and to deny the surplus labor hypothesis are not, however, equivalent to advocating population growth. If the population continues to grow at the present rate, a larger labor force can, and probably will, be productively employed in agriculture, rather than being shunted largely to the cities. If, however, population growth is brought under rapid control, the trend toward more labor-intensive agriculture will make possible a greater improvement in per capita income. Labor will shift from the worst to better land. The poorest land will go out of cultivation as the returns to labor and capital on the intramarginal lands go up. Ricardian analysis will suffice to show that a more labor-intensive production function in agriculture need not be linked to a demand for population growth!

The "safety valve" reduction in the size of the large holdings which is beneficial in the short run, given the technical conditions and incentives prevailing in Indian agriculture, will perhaps make reorganization on the basis of mechanization and advanced technology eventually more difficult. The latter requires larger units, not smaller. However,



there is no evidence that India, given her present resource-mix, is destined to take this road in the decades immediately ahead. Rather, the Japanese example of highly productive, small-unit peasant farming holds out the most promising prospect.

Finally, on the basic issue of the zero marginal product of labor and disguised unemployment, the evidence offered here supports the position taken by Viner, Schultz, and Oshima, against the more generally accepted views of Lewis, Wonnacott, Ranis and Fei, Eckaus, Coale and Hoover, Nurkse, and many others who maintain that Indian agriculture suffers from a redundant labor force with a zero marginal value product. The data indicate not only a positive marginal product of labor, but also lend support to the hypothesis that the rationalization and improvement of agricultural techniques, generated by development efforts, will exert a strong upward pull on the demand for agricultural labor.

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# UNDEREMPLOYMENT AND DEVELOPMENT IN DUAL ECONOMIES: TESTING ALTERNATIVE THEORIES

Dale W. Jorgenson

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These are  
excerpts  
from the  
paper.

As a branch of general economic theory, the theory of development of a dual economy is of relatively recent origin. It is widely recognized that, under contemporary conditions, most backward economic systems have important relations with advanced economies, either through international trade or through the establishment of a modern "enclave" in an otherwise backward social and economic setting. Either relationship gives rise to economic and social "dualism" in which a given economic or social system consists of two component parts -- an advanced or

Dale W. Jorgenson is Professor of Economics at the University of California, Berkeley (Calif.).

modern sector and a backward or traditional sector. Neither theories of economic growth for an advanced economy nor theories of development for a backward economy are directly applicable to the development of a dual economy.

### Two Approaches

One can discern two alternative approaches to the theory of development of a dual economy. In what we will call the "classical" approach, represented in the writings of W. Arthur Lewis, it is assumed that there is some level of the agricultural labor force beyond which further increments are redundant. In the "neoclassical" approach, characteristic of Theodore Schultz and Harry Oshima, the marginal productivity of labor in agriculture is assumed to be always positive so that labor is never redundant. In the "classical" approach, the real wage rate, measured in agricultural goods, is assumed to be fixed "institutionally" so long as there is disguised unemployment in the agricultural sector. In the "neoclassical" approach, the real wage rate is assumed to be variable rather than fixed; it is further assumed that, at very low levels of income, the rate of growth of population depends on the level of income.

These differences in the characterization of the backward or traditional sector of the economy have implications for the behavior of that sector. According to the classical approach, the agricultural labor force must decline before the end of the phase of disguised unemployment; in the neoclassical approach, the agricultural labor force may rise, fall, or remain constant.

The differences between the two approaches also have implications for the behavior of the advanced sector. These implications depend on the actual behavior of the terms of trade between the backward and advanced sectors. Assuming that the terms of trade between the backward and advanced sectors remain constant, we have derived the following implications of the classical approach: 1) so long as there is disguised unemployment in the backward sector, labor productivity in the advanced sector remains constant; 2) capital grows at a slower rate than output and labor so that capital-output ratio falls; 3) the rates of growth of manufacturing output, employment, and capital increase during the phase of disguised unemployment. For the neoclassical approach, the corresponding results are: 1) manufacturing employment grows more slowly than either output or capital so that labor productivity in the advanced sector rises; 2) the capital-output ratio remains constant; 3) the rates of growth of manufacturing output and employment decrease throughout the development process. Since the classical approach reduces to the neoclassical approach after the phase of disguised unemployment is completed, the two approaches have different implications only for situations where it is alleged that disguised unemployment exists.

The implications of the two approaches that are different may be classified into three groups: 1) those resulting from the basic assumptions about disguised unemployment; 2) indirect implications about the behavior of the backward sector of the economy; 3) indirect implications about the behavior of the advanced sector of the economy. In reviewing the evidence pertaining to the development of a dual economy, we will first discuss the evidence for and against the existence of disguised unemployment and historical evidence for and against the constancy of the real wage rate in certain historical circumstances where disguised unemployment has been said to exist. Then, we will discuss the evidence for and against the indirect implications of the two alternative approaches, first in the traditional and then in the advanced sector. Since the indirect implications refer mainly to historical trends in economic development, we will concentrate on the historical development of the Japanese economy, which is cited in support of the classical approach by Fei and Ranis, and by Johnston.

#### Disguised Unemployment: the Evidence

Lewis, in his treatise, The Theory of Economic Growth, maintains that "the phenomenon of disguised unemployment is rare in Africa and in Latin America, but it repeats itself in China, in Indonesia, in Egypt and in many countries of Eastern Europe." In a later presentation, he states that, more than half of the world's population (mainly in Asia and in Eastern Europe) lives in conditions which correspond to the classical and not to the neoclassical assumptions." Fei and Ranis state that, "The empirical support of both our theory and policy conclusions draws heavily on the experience of nineteenth century Japan and contemporary India."

Lewis' allegations that disguised unemployment exists in Asia and Eastern Europe are based on a substantial literature on the problem dating from the 1930s and early 1940s. This literature has been surveyed by Kao, Anschel, and Eicher. Estimates of disguised unemployment in the early literature are based on what they call the "indirect method" of measurement. In this method, labor requirements for production of the current level of agricultural output and labor available from the agrarian population are estimated; the difference between labor available and labor required is called "disguised unemployment."

One fallacy underlying this method is that agricultural work in all countries is highly seasonal. Substantial parts of the agricultural labor force may be unemployed in agriculture during a part of the year without being redundant. The critical test is whether the agricultural labor force is fully employed during peak periods of demand for labor such as planting and harvesting. Only if labor is redundant during periods of peak demand could the agricultural labor force be reduced without reducing agricultural output. A second fallacy underlying the indirect

method is that all members of the agricultural population older than some minimum age, usually 15, are treated as members of the agricultural labor force and that younger members of the population are not.

All of the studies of the 1930s and early 1940s are based on the indirect method of measurement. Examples are provided by the work of Buck on China and of Warriner, Rosenstein-Rodan, and Mandelbaum on Southeastern Europe. More recent examples may be found in the work of Warriner on Egypt, of Mellor and Stevens on Thailand, and of Rosenstein-Rodan on Southern Italy.

Warriner has subsequently withdrawn from her position on disguised unemployment in Egypt, noting that her earlier estimate was based on a fallacious set of assumptions. Kenadjian has corrected Rosenstein-Rodan's estimate of disguised unemployment for Southern Italy to take seasonal demands for labor into account, thus reducing the estimate of disguised unemployment to less than 5 percent. Pepelasis and Yotopoulos, measuring disguised unemployment in Greece and taking into account the seasonal pattern of demand for labor, conclude, "From the eight years of our series, [disguised unemployment] existed only in 1953 and 1954. . . . The other years of the period are marked by a seasonal shortage of labor." A corrected version of Buck's estimate of disguised unemployment has been presented by Hsieh, "... the conclusion that, in the majority of the localities, . . . there was, at the seasonal peak, a shortage of male labour, which had to be reinforced by a large number of female workers, probably applies not only to many other areas of China but also to other Asian countries. Field investigations of several other localities in China and the rural districts of Bengal in India reveal a similar situation. Considering the extremely intensive input of labour in their farm operations, this is not unexpected." We conclude that estimates of disguised unemployment based on the indirect method of measurement always overestimate the amount of disguised unemployment. When these estimates are corrected to take into account the seasonality of demands for agricultural labor, the situation in Southeastern Europe, Egypt, China, and Southeast Asia appears to be one of labor shortage rather than labor surplus.

Almost all of the evidence for the existence of disguised unemployment is based on the indirect method of measurement. However, attempts have been made to test for the existence of disguised unemployment by examining historical instances in which substantial parts of the agricultural labor force have been withdrawn in a short period of time. Another class of examples consists of studies of the effects of famines and epidemics. A third type of evidence used to test for the existence of disguised unemployment consists of anthropological studies of peasant agriculture. Eighteen studies by anthropologists and

economists are cited by Oshima in support of the following position: "Despite the limitations of the empirical material, there is no denying the general picture that emerges for Asia. The labor requirement during busy seasons exceeds the male, adult population so that female and juvenile labor must be recruited into the labor force. And, ... no part of this larger labor requirement seems redundant, given the existing technology and organization. A withdrawal of portions of the labor force may be expected to reduce total output (in the sense that insufficient plowing, inadequate planting, and untimely harvesting will diminish the size of the final crop)."

Such evidence is subject to the criticism that one cannot generalize from particular examples. However, in view of the consistency of the evidence from indirect estimates of disguised unemployment for the entire agricultural labor force of countries such as Greece, Southern Italy, Egypt, and China with the evidence from both historical and anthropological studies, it may be concluded that disguised unemployment simply does not exist for a wide range of historical and geographical situations where it has been supposed to exist. Furthermore, this conclusion is consistent with the evidence from indirect measurement in the case of Southeastern Europe, and with historical and anthropological evidence in the case of India and Southeast Asia. We may conclude, with Kao, Anschel, and Eicher that, "... it is an understatement to say that the development literature in [the early 1950s] was optimistic about development through the transfer of redundant agricultural labor to other occupations... To date, there is little reliable empirical evidence to support the existence of more than token -- 5 percent -- disguised unemployment in underdeveloped countries..."

This evidence does not demonstrate that disguised unemployment never exists in any historical or geographical circumstances, but only that the scope of applicability of the classical approach to the development of a dual economy is severely limited.

#### Indirect Evidence from the Traditional Sector: Japan

For Japan, it is possible to check out the indirect implications of the classical and neoclassical approaches for historical trends in economic development. Japan is the only Asian country for which long-term data exist for trends in agricultural and nonagricultural labor force, agricultural and nonagricultural output, and capital formation. Furthermore, Japanese historical development has been cited in support of the classical approach by Fei and Ranis and by Johnston. Since the Japanese data are the only empirical support offered for their assumption of an unlimited supply of labor at a constant real wage, Japanese economic development up to 1918 provides an important test



case for the classical approach to the theory of development of a dual economy.

We first consider the indirect implications of the classical approach for the agricultural sector. Fei and Ranis assume that there is an institutionally fixed real wage, equal to the initial average productivity of labor. Ohkawa and Rosovsky provide data from which real labor income per capita in agriculture for the period 1878-1917 may be estimated. This results in the series for labor income presented in Table I.

Table I. Real Labor Income Per Capita in Japanese Agriculture, Five-Year Averages, 1878-1917

| Agricultural Income to all factors, 1913-17 = 100 |      |
|---|------|
| 1878-82   | 18.0 |
| 1883-87   | 18.1 |
| 1888-92   | 18.2 |
| 1893-97   | 21.1 |
| 1898-02   | 27.0 |
| 1903-07   | 31.3 |
| 1908-12   | 39.4 |
| 1913-17   | 42.0 |

Source: Computed from Ohkawa and Rosovsky, 1960.

For the period 1878-1917, the assumption of a constant real wage rate in the agricultural sector is inconsistent with the evidence. The hypothesis of a constant real wage rate in the agricultural sector where disguised unemployment exists is the most important assumption underlying the classical approach to the theory of development of a dual economy.

A second implication of the classical approach for the behavior of the agricultural sector is that the agricultural labor force must decline absolutely as redundant labor leaves the land and later as disguised unemployment is eliminated. This decline must include all of the redundant labor force together with that part of the labor force with marginal productivity less than the real wage rate.

The typical pattern of economic development in Europe is a constant or moderately rising agricultural labor force until just before or just after the relative importance of the nonagricultural population surpasses that of the agricultural population. Subsequently, the agricultural labor force begins to fall. In short, absolute reductions in the size of the agricultural labor force occur after industrialization is well underway rather than during the early stages of industrialization.



This pattern also characterizes Japan. The agricultural labor force was essentially constant from 1878-82 to 1903-07 and fell about 7 percent from 1903-07 to 1913-17. Since Fei and Ranis place the end of the surplus labor period at 1918, we may conclude that 7 percent can serve as an upper boundary for the percentage of the labor force that could be classified as redundant.

The movement of labor from the rural areas to the advanced sector did not involve the transfer of a reserve army of the disguised unemployed. The process is described by Ohkawa and Rosovsky as follows: "During the early period of industrialization, necessary increases in the labor force did indeed come from the rural areas. But laborers were usually young and left single. There was little movement in terms of family units, and no formation of an agricultural proletariat. [In fact, the number of farm households increased slightly between 1884 and 1920.] Thus, a fairly typical Asian agricultural system remained in existence and was utilized to promote impressive increases in productivity, while Western technology was making rapid progress in manufacturing."

The Japanese pattern may be regarded as similar to that of many European countries, including countries of Northwestern Europe, where the period preceding the predominance of the nonagricultural labor force in the total labor force is characterized by a stable agricultural labor force, rising or declining at very moderate rates throughout the period of initial industrialization. This pattern is inconsistent with the hypothesis of redundant labor or of disguised unemployment. However, the pattern is entirely consistent with the neoclassical theory of the development of a dual economy. We may conclude, with Ohkawa and Minami, that, "... in the light of Japanese experience with the initial phase of economic development, traditional agriculture based on household production grew at a considerable rate in terms of both output and productivity; technological progress had taken place and the level of living and wage rates increased to a certain extent. These responses occurred together with the increase in population. In view of this, it seems that the features of models of the Lewis type are too rigorous to be applied to such historical realities."

#### Indirect Evidence from the Advanced Sector: Japan

As we have already pointed out, the implications of the classical approach for the advanced sector depend on the historical development of the terms of trade between agriculture and industry. Data on the terms of trade are presented by Ohkawa and Rosovsky. These data are consistent with the assumption that the terms of trade are essentially constant throughout the period before 1917. Accordingly, the implications of the classical approach on this assumption may be confronted with data on the development of the nonagricultural sector of the Japanese economy for this period.

The first implication of the classical approach for the advanced sector is that labor productivity remains constant during the phase of disguised unemployment. The corresponding implication of the neo-classical approach is that labor productivity is always rising. Real incomes per member of the labor force in secondary and tertiary industry for the period 1878-1917 given by Ohkawa are presented in Table II. The data show an increase in labor productivity from 1878-82 to 1913-17 of 239 percent in secondary industry and 213 percent in tertiary industry. These increases in productivity are inconsistent with the implication of the classical theory that nonagricultural labor productivity remains constant throughout the phase of disguised unemployment. Increases in labor productivity are a direct implication of the neoclassical approach. The data on labor productivity provide very powerful support for the neoclassical theory.

Table II. Real Income Per Capita in Japanese Industry,  
Five-Year Averages, 1878-1917

| 1913-17 Average = 100 |                    |                   |
|-----------------------|--------------------|-------------------|
|                       | Secondary Industry | Tertiary Industry |
| 1878-82               | 137                | 156               |
| 1883-87               | 173                | 199               |
| 1888-92               | 189                | 197               |
| 1893-97               | 217                | 227               |
| 1898-02               | 268                | 261               |
| 1903-07               | 237                | 261               |
| 1908-12               | 266                | 313               |
| 1913-17               | 327                | 333               |

Source: Ohkawa, 1957.

A second implication of the classical approach for the advanced sector is that the rates of growth of output and employment increase over time. The corresponding implication of the neoclassical approach is that rates of growth of both variables decline over time. The rate of growth of real income has a substantial downward trend for the period 1878-1917. The rate of growth of the nonagricultural labor forces shows a high initial value but declines monotonically as development proceeds. These trends are inconsistent with the implications of the classical approach. Data on the rates of growth of output and employment provide additional support for the neoclassical theory.

A third implication of the classical approach for the advanced sector is that the capital-output ratio falls throughout the phase of disguised unemployment and that the rate of growth of capital increases over time. In the neoclassical approach, the capital-output ratio eventually becomes

constant since the rate of growth of output and the rate of growth of capital tend to the same limit. Data on net capital stock for the period 1883-1917 are given by Ishiwata. There is essentially no trend in the rate of growth of capital during this period.

The capital-output ratio for the advanced sector has been computed from Ishiwata's data on capital, from Ohkawa's data on real income, and also by Ishiwata from an alternative set of data. (See Table III.) For the period as a whole, the capital-output ratio shows a substantially increasing trend. The implication of the classical approach for the period prior to 1917 is inconsistent with the evidence. The data on capital-output ratios provide additional support for the neoclassical theory.

Table III. Capital-Output Ratio in Japanese Industry,  
Five Year Averages, 1883-1917

|         | Ohkawa<br>Real Income | Ishiwata<br>Real Income |
|---------|-----------------------|-------------------------|
| 1883-87 | 1.96                  | 1.56                    |
| 1888-92 | 1.99                  | 1.51                    |
| 1893-97 | 1.88                  | 1.53                    |
| 1898-02 | 1.80                  | 1.52                    |
| 1903-07 | 2.03                  | 1.72                    |
| 1908-12 | 2.10                  | 1.82                    |
| 1913-17 | 2.24                  | 1.79                    |

Source: Computed from Ohkawa, 1957, and Ishiwata, no date.

### Conclusions

The evidence on Japanese economic development from 1878 to 1917 supports the neoclassical rather than the classical approach to the theory of development of a dual economy. The basic assumptions of the classical approach are inconsistent with the evidence. Its implications are also inconsistent with the evidence, while the implications of the neoclassical approach are strongly supported by the evidence. The evidence on Japanese economic development corroborates the evidence we have reviewed for and against the existence of disguised unemployment in Latin America, Africa, Southeastern Europe, India, China, and Southeast Asia. We conclude that the neoclassical theory of the development of a dual economy is strongly supported by the empirical evidence and that the classical approach must be rejected.

## SOME SOURCES ON UNDEREMPLOYMENT IN AGRICULTURE

Use of redundant farm labor for economic development was first dealt with by Alfredo and Ifigenia M. NAVARRETE in El Trimestre Económico, XVII, 1951, translated as "Underemployment in Underdeveloped Economies," International Economic Papers, No. 3, 1953. Early and influential formulations were made by Ragnar NURKSE in Problems of Capital Formation in Underdeveloped Countries (Oxford, 1953) and by W. Arthur LEWIS, whose ideas are most readily available in his book, The Theory of Economic Growth (Homewood, Ill., Irwin, 1955). Others are by R. S. ECKAUS in "Factor Proportions in Underdeveloped Countries," American Economic Review, XLV, 1955, John W. MELLOR and R. D. STEVENS in "The Average and Marginal Product of Farm Labor in Underdeveloped Economies," Journal of Farm Economics, XXXVIII, 1956, and Paul N. ROSENSTEIN-RODAN, "Disguised Unemployment and Underemployment in Agriculture," Monthly Bulletin of Agricultural Economics and Statistics, VI, 1957. Harvey LEIBENSTEIN's argument, based on work units and food supply, in "The Theory of Underemployment in Backward Economies," Journal of Political Economy, LXV, 1957, presents an interesting variant.

These analyses were rejected notable by N. KOESTNER, "Some Comments on Professor Nurkse's Capital Accumulation in Underdeveloped Countries," L'Egypte Contemporaine, XLIV, 1953, by Jacob VINER, "Some Reflections on the Concept of Disguised Unemployment," Contribuições a Analise do Desenvolvimento Económico (Rio de Janeiro, Livraria Agir Editora, 1957), reprinted in Indian Journal of Economics, XXXVIII, 1957, and by Theodore W. SCHULTZ, "The Role of Government in Promoting Economic Growth," in Leonard D. White (ed.), The State of the Social Sciences (Chicago, 1956), and in his book, Transforming Traditional Agriculture (New Haven, Yale, 1964).

The doctrine of disguised unemployment is one of the important axioms of many models of development in a dual economy. The best known of these is that of Gustav RANIS and John C. H. FEI, "A Theory of Economic Development," American Economic Review, LI, 1961, and Development of the Labor Surplus Economy (Homewood, Ill., Irwin, 1964). Many of the concepts embodied in the model can be found in Luigi SPAVENTA's article, "Dualism in Economic Growth," Banca Nazionale del Lavoro Quarterly Review, XII, 1959. An exchange between Harry T. OSHIMA and Ranis and Fei in the American Economic Review, LIII, 1963, reveals different points of view. Howard S. ELLIS, "Las Economías Duales y El Progreso," Revista de Economía Latinoamericana, 1961, presents a review of dual growth models.

Many studies have aimed partially or exclusively at determining whether there was substantial underemployment, usually in some specific country or area. Some of those, which found that there was, are:

John L. BUCK, Chinese Farm Economy and Land Utilization in China, Chicago, University of Chicago Press, 1930 and 1937,

Doreen WARRINER, Economics of Peasant Farming, London, Oxford, 1939,

K. MANDELBAUM, The Industrialization of Backward Areas, Oxford, Blackwell and Mott, 1945,

WARRINER, Land and Poverty in the Middle East, London, Royal Institute of International Affairs, 1948,

ROSENSTEIN-RODAN, "Problems of Industrialization of Eastern and South-Eastern Europe," Economic Journal, LIII, 1943,

Ansley J. COALE and E. HOOVER, Population Growth and Economic Development in Low-Income Countries: A Case Study of India's Prospects, Princeton, 1958,

N. A. MUJUMDAR, Some Problems of Underemployment, Bombay, Popular Book, 1961, and

Bruce F. JOHNSTON, "Agricultural Development and Economic Transformation: A Comparative Study of the Japanese Experience," Food Research Institute Studies, III, 1962.

Others that did not discover significant underemployment are:

Chiang HSIEH, "Underemployment in Asia: Nature and Extent," International Labour Review, LV, 1952,

WARRINER, "Land Reform and Economic Development," Fiftieth Anniversary Commemoration Lectures, Cairo, National Bank of Egypt, 1955,

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Berdj KENADJIAN, "Disguised Unemployment in Underdeveloped Countries," Zeitschrift für Nationalökonomie, XXI, 1961,

Adamantios A. PEPELASIS and Pan A. YOTOPOULOS, Surplus Labor in Greek Agriculture, Athens, Center for Economic Research, 1962, and

K. OHKAWA and R. MINAMI, "The Phase of Unlimited Supplies of Labour," Hitotsubashi Journal of Economics, VI, 1964.





## STIMULATING ENTREPRENEURSHIP FOR SMALL INDUSTRY

Small industry is important to economic activity in all stages of growth, but it is easy for planners to overlook it and to concentrate on large-scale industrialization.

These three selections suggest that planners would be well advised to stimulate small-scale entrepreneurial activity and modernization. Eugene STALEY presents in a summary form many of the ideas developed at greater length in his book, jointly authored by Richard Morse, Modern Small Industry for Developing Countries (New York: McGraw-Hill, 1965), the most comprehensive work on this subject [ see review, Development Digest, April 1966]. The measures taken in Asian countries to aid small industry and train small-scale entrepreneurs are summarized from a paper presented at the recent Asian Conference on Industrialization. Some experiments to stimulate entrepreneurial activity are described by David McCLELLAND, whose ideas on achievement motivation were presented in the July 1965 Development Digest.

## DEVELOPMENT OF SMALL-INDUSTRY PROGRAMMES

Eugene Staley

[ From a paper presented to the second study conference on problems of economic development, organized by the Organisation for European Economic Cooperation, Madrid, 10-15 April 1961. Papers and proceedings of the conference were published as Methods of Industrial Development With Special Reference to Less Developed Areas, Albert Winsemius and John A. Pincus (eds.), Paris, Organisation for Economic Cooperation and Development, 1962, US\$ 5.00, 351 pp. ]

These are excerpts from the paper.

In most industrialisation programmes, too little attention has been paid to the benefits to be gained by helping existing small industry to modernise and by stimulating the growth of new, modern small industry. Often, in countries striving to industrialise, small-scale manufacturing has been regarded as an inevitably backward and lagging part of the economy, perhaps to be aided for social reasons and in a rather defensive or protective spirit, but not as a promising opportunity for development. A latent resource has thus been overlooked and neglected.

Lately, however, many countries have shown interest in small-industry development activities. A few have evolved well thought-out and comprehensive programmes. More have adopted rather sporadic, isolated measures responding to some single aspect of small-industry needs, like the need for capital and credit or the need for technical improvement.

Eugene Staley is Senior International Economist at the Stanford Research Institute and Professor of Education at Stanford University (Calif.).

Small industry is felt to have significance in countries at very different stages of industrialisation and in a wide range of ideological settings. One purpose of this paper is to take note of the more promising methods of small-industry development that are being tried. It should be stressed, however, that no system worked out in one country can be recommended in its entirety for another country. Rather, the development officials of each country must analyse their particular country's small-industry problems and opportunities, then borrow some ideas and invent some new ones in order to act creatively and practically in their specific situation.

Confusion in the use of terms has impeded clear thinking about the role of small industry in industrial development. The confusion is compounded by a tendency to identify smallness with certain other characteristics. Thus, "small industry" and "village industry" are sometimes lumped together, which is unfortunate because small-scale manufacturing goes on not only in villages, that is, in rural areas, but in urban areas as well. More important, smallness and outmoded techniques are often treated as inseparable.

At present, it is undoubtedly true that the great majority of small-scale manufacturers in the countries referred to have backward technology, inefficient management, and low productivity. But these are not inevitable characteristics of small industry. There are modern, efficient, small-manufacturing enterprises in many countries, and in some highly industrialised countries, the average labour productivity in small plants is not very far below that in large plants.

In this paper, "small industry" will mean all types of manufacturing carried on in relatively small establishments -- roughly, establishments with less than 100 employees. I prefer, however, to define small industry, not in statistical terms, but in terms of certain functional characteristics which make its problems and its opportunities somewhat different from those of medium or large industry. These functional characteristics include relatively little specialisation in management ("one-man" management), lack of access to capital through the organised securities' market, no special bargaining strength in buying or selling in a major market, and often, though not always, a relatively close integration with the local community through local ownership and management and dependence on nearby markets and sources of supply. These characteristics give small industry certain disadvantages, and certain special needs for types of advice and aid which are not so much needed by large manufacturing firms. They also confer some advantages, chief of which is flexibility. The close personal contact which "one-man" management makes possible between the top manager and production workers, customers, suppliers, and owners can be, if the manager is a good one, a source of strength in many ways. This characteristic goes far to explain why, and in what kinds of manufacturing, modern small industry can compete successfully with large industry.

## Small Industry in the Modern Economy

As a country moves from a traditional economy through a transitional phase of development and industrialisation to a modern economy, what will happen to its small-industry sector? We can throw light on this problem by examining the role of small industry in some countries that already have an advanced degree of modernisation and industrialisation.

Though industrialisation does bring large manufacturing units, and though large industry grows relative to small industry, small industry by no means disappears even in the most highly industrialised countries. But, it takes more modern forms.

For example, in the United States, contrary to an impression that seems to be rather widely spread, there are many small factories. They employ an important share of all manufacturing workers and produce an important share of the total manufactured output. More than 90 percent of all manufacturing establishments in the United States in 1954 had fewer than 100 employees. These establishments employed 26 percent of all manufacturing employees and produced 22 percent of the total value added by manufacture. The relative importance of small manufacturing in West Germany and the United Kingdom is still greater -- 27 percent and 33 percent of all manufacturing employees respectively. In Puerto Rico, Australia, and Japan, the percentages are even higher -- 41, 50, and 59 percent respectively.

The types of small industry found in the highly industrialised economies are very different, however, from those found in traditional economies. Most small factories in the United States are "modern" in the sense that they use reasonably up-to-date tools, equipment, and processes. Perhaps they are more deficient in management methods. The percentage of manufacturing output produced by small manufacturing establishments in the United States is not much less than their percentage of manufacturing employment (22 against 26). In other words, the average productivity per worker is almost as great in small factories as in large. The same holds for West Germany and Puerto Rico. For Japan, however, the 59 percent of manufacturing employees who work in small establishments produce only 37 percent of manufacturing output. Evidently the average productivity per worker is considerably less in small establishments than in large ones, reflecting lower capital investment per worker, less advanced technology, and less efficient management. It is also reported that wages in Japanese small industry are considerably lower than for comparable work in large industry, whereas in the United States, and probably in the industrially advanced countries in Europe, the gap is not so great.

Household industry and artisan industry are the principal forms of manufacturing in a traditional economy. What role do they play in modern, highly industrialised economies, and what is the long-term outlook for them in countries now engaged in modern industrial development?

As countries attain a high degree of development, the trend will be for household industry to disappear, save for a few special functions. For purposes of regular production of manufactured goods, the place of household industry in a truly modern economy is and should be quite limited, for it is a relatively inefficient method of production and is subject to social abuses which it is practically impossible to control, such as low rates of pay, long hours, and child labour. Newly industrialising countries would do well to regard their household industries as a transitional form, to be supplanted ultimately by geographically decentralised small factories, artisan workshops located outside the home, and large factories.

The outlook for artisan-type activities as the economy moves toward modern industrialism is much more positive. This statement may seem surprising. We see in newly industrialising countries the devastating competition of factory-made goods with the old-line craftsmen such as weavers, potters, blacksmiths, and shoemakers. But there is another side to the story. New, distinctly modern artisan activities (not manufacturing as such, but services) arise with modern industry and modern technology: automobile repairing, repair and servicing of radios and other electrical equipment, photographic work. These activities employ many "new-line" craftsmen, such as mechanics and electricians. The rise of these new branches have belied predictions that factory competition would lead to the disappearance of the craftsman. The highly industrialised, modern economies of today seem, on the contrary, to be using increasing numbers of new types of craftsmen whose functions have undergone a transformation from the making of manufactured goods to their installation, servicing, and repair. These new tasks supplement factory production rather than compete with it. The long-term problem of the newly industrialising countries would therefore seem to be to help their artisans to adjust themselves to new functions.

This is not to deny that there are difficult short-term problems as factory goods compete with traditional artisans. The transitional adjustments are not easy. But, the basic strategy must be to help the artisans in one of two ways. Some can be helped to adapt their skills to the rising modern demands instead of the declining traditional demands. This means village blacksmiths' learning to install and repair irrigation pumps and diesel engines, skilled weavers' concentrating on designs and qualities not readily reproducible by machine, shoemakers' turning to shoe repairing. Others must be guided into entirely new occupations for which the demand is rising as development takes place.

The outlook, in summary, is for household industry to be replaced, for artisan industry to be transformed, and for the small but modern factory to be developed as a country moves through the transitional stage from a traditional toward a modern economy.



## Relations of Small and Large Industry

Large factories are a characteristic feature of the modern industrial economy, but they are not the whole of it. Not all manufacturing is more economical on a large scale than on a small scale. A country will have the most productive industrial structure when it has an interwoven combination of large and small units in which the place of each is determined on the basis of economic efficiency.

But will not the large manufacturing firms drive out the small ones? Can the small enterprise, lacking a staff of specialists and with limited access to capital, compete against large, highly organised, highly capitalised firms? The answer is that many small manufacturing establishments can and do compete quite successfully. Others do not compete directly with large factories, but rather serve as a complement to them. We shall list and illustrate five ways in which small industry can and does manage to co-exist successfully with large industry:

1) Small industry can out-compete large industry, in certain circumstances, in selected products. Bricks and tiles, for example, can be produced more economically in relatively small, local establishments than in a great central factory which would incur high shipping costs. Fresh baked goods, being perishable, are often produced in neighbourhood establishments, if not in the home itself.

Small manufacturing establishments have an advantage in meeting highly specialised or individualised demands or in catering to a small-volume market or one requiring frequent quick adjustments because of style changes or for other reasons. Small manufacturers often compete very well in certain kinds of precision instruments, some types of specialised machinery, some types of surgical equipment, women's wear, and so on. The flexibility of the small firm stands it in good stead.

The well known economies of scale are much more important in some lines of production than in others. For example, the engineering advantages and the cost advantages of using big pieces of equipment to handle large amounts of materials are very important in connection with blast furnaces and cement kilns, so that these are not undertakings suitable for small units. But in the manufacture of furniture or garments or certain kinds of machine tools, the advantages of scale are much less important; in these lines the small plant may be just as efficient as, or even more efficient than, the larger one.

Where labour and social laws are applied more stringently to large than to small plants, as is often the case, especially in newly industrialising countries, this is a factor in the competitive ability of small plants.

2) Small industry can "fill the cracks" between the large-volume, standardised outputs of large industry. "Rapid Cycles" is a small



manufacturing firm in the environs of Madras, India. It had about 30 workers when I first visited its thatched-roof plant. Two years later, employment had grown to 100 workers and there was an excellent new building with modern equipment. The firm was prospering, yet only a few miles away was the very large plant of "T.I. Cycles, Ltd.," manufacturing bicycles with the collaboration of a well known British firm. How could this small enterprise compete so successfully? It was not, in fact, competing directly. Instead of the standard-size bicycle, it was producing a junior size, also tricycles and tricycle-mounted delivery carts. The proprietor said he had no trouble selling all he could produce.

3) Small industry can produce components and supplies for large industry. One of the reasons for the efficiency of American industry is that large plants integrate their production with the production of hundreds or even thousands of other plants, both large and small. A large part of Japanese small industry produces on sub-contract for large industry. At its limit, the relationship is one of complete subordination to or affiliation with the large company. Large factories supply iron and steel to small plants and workshops manufacturing parts of such articles as sewing machines, bicycles, automobiles, optical and precision instruments, watches, and appliances. Others supply yarn to small weaving mills, processed clay and glazes to small ceramics factories, and so on.

4) Small industry can initiate new products (and sometimes grow large with the growth of the product). Henry Ford and other pioneer automobile manufacturers started on a very small scale. In countries where industrial diversification is at an early stage, small manufacturers may find opportunities in introducing products that are new to the country though not necessarily new in the world.

5) Small industry (more accurately, service-trade successors of artisan industry) can install, service, and repair the products of large industry.

#### Small Industry in Newly Industrialising Economies

Some of the factors which enable small manufacturing units to exist despite the rise of large industry apply with more force in newly industrialising countries than in highly industrialised ones. The size of the market for nearly all kinds of manufactured goods is smaller. Markets are also more broken up into relatively isolated submarkets because of comparatively inadequate development of transport and communication. Also, there is likely to be a scarcity of people experienced in managing large operations, and among the workers the habits of industrial discipline which are necessary for the success of large-scale operations are likely to be less well established. The human factors

which weigh on the side of small organisations are likely to be even more important in countries that are still in the course of developing modern industry.

Industrialising countries which devise ways to encourage the modernisation and growth of their small-industry sectors can expect certain specific advantages to their overall development programmes. Resources of capital, of entrepreneurship and managerial talent, and of labour may be tapped through small-industry development which would otherwise not be effectively available at all.

The small industrial enterprise is typically financed by an individual, his family, or his friends. Impelled by their personal concern for the venture, they scrape together funds wherever they can find them, and it is oftentimes surprising what amounts they do find, even where incomes are very low. Then, if the spirit of entrepreneurship is really strong, they stint themselves to plough back earnings. The capital thus formed probably never would come into existence as productive capital except for the small enterprise. The equivalent would not be saved to invest in government bonds or to put in banks or to loan for the use of others.

Perhaps the quantitative significance of such capital formation may not be very great in relation to the country's entire need for capital. More significant is the related contribution of an active, modern, small-industry sector as a seedbed of entrepreneurship and as a means of discovering latent talent for organisation and management. These are among the scarcest factors of production in economies in the course of development.

Again, a positive programme of small-industry development, especially if extended to smaller communities throughout the country, may tap unused resources in the form of labour which is underemployed or unemployed. Small industrial units can play a useful role in regional development, industrial decentralisation, and growth of rural or small-town industry.

Another advantage to be gained by encouraging the vigorous growth of small industry should appeal particularly to thoughtful economic planners. The amount of costly misinvestment as a result of mistaken decisions on what to produce and how and when and where to produce it may thereby be lessened. If the decisions on new manufacturing investment are made only in large blocks, and if now and again somebody makes a mistake -- the engineers miscalculate, or the economists and the marketing people incorrectly judge costs and demand -- very large mistakes are going to be made. If the decisions are smaller ones, involving smaller units, there will be some mistakes, but, before the waste of investment has gone very far, the mistakes will be seen and resources can be diverted to other, more promising lines of development.

Again, it is a reasonably hypothesis that encouragement of modernisation and growth in small industry will help to build a more truly competitive and less monopoly-ridden private sector. This will reduce somewhat the burden on the government of having to regulate and watch the private sector in detail to keep it from exploiting monopolistic advantages. Efficient small units will help to make the manufacturing sector self-policing, so to speak, limiting the extent to which a few large units can, with impunity, charge higher prices than necessary or fail to do a good job of production.

Finally, there are some sociological and political advantages in encouraging small industry. Such encouragement should help to develop a middle-class group of independent, smaller businessmen which, on the whole, is a desirable and much needed element in a society.

#### Products Suitable for Small-Industry Production

By studying the experience of various countries, it is possible to get some clues as to the specific products in which small manufacturing units seem generally able to compete best. Some evidence from Japan on this point is presented in Table I.

Table I. Share of Small Enterprises in Total Production, by Industry, Japan, 1954\*

| Percent Produced by<br>Small Enterprises |     | Percent Produced by<br>Small Enterprises |    |
|--|-----|--|----|
| Toys                                     | 100 | Household utensils                       | 87 |
| Sewing needles                           | 100 | Grindstones                              | 85 |
| Metal tableware                          | 100 | Platform scales                          | 84 |
| Violins                                  | 100 | Valve cocks                              | 82 |
| Lacquer ware                             | 100 | Leather shoes                            | 81 |
| Paving bricks                            | 100 | Fishing nets                             | 80 |
| Western clothes                          | 98  | Forged products                          | 80 |
| Tools                                    | 97  | Printing ink                             | 78 |
| Cotton processing                        | 97  | Pottery                                  | 78 |
| Underwear (knitted)                      | 96  | Woolen goods                             | 78 |
| Underwear (cloth)                        | 95  | Leather goods for<br>industrial use      | 76 |
| Hemp netting                             | 95  | Laces                                    | 75 |
| Knitted socks                            | 94  | Bicycle parts                            | 74 |
| Metal lath                               | 93  | Fountain pens                            | 74 |
| Braids                                   | 92  | Farm implements                          | 71 |
| Silk and rayon cloth                     | 91  | Light metal sheet<br>products            | 71 |
| Parts of communi-<br>cation machines     | 87  |  |    |

\*Manufacturing enterprises employing up to 300 are classed as small. Handicrafts excluded.

Source: Japanese Ministry of International Trade and Industry

The suitability of a product for small-scale manufacture depends, of course, on many factors in the economic environment which can only be determined by detailed study of concrete situations. There will be quite divergent types of opportunity for small industry even in neighbouring countries, and in different parts of the same country. A certain general progression may be noted as a country moves from the traditional economy through the transitional stages of development toward a modern, industrialised economy.

In encouraging development of small factories, careful selection of suitable products is essential. The suitability of a given product for small-scale manufacture varies from country to country, from one part to another of the same country, and from time to time as a country develops. Because so many technical and economic factors are involved, provision for continuing analysis of specific situations is advisable in small-industry development programmes.

### Methods of Fostering Modern Small Industry

Let us assume that the responsible development officials of a country are seeking to diversify and expand its industries and are convinced of the desirability of making more effective use of the latent resources in the small-industry sector. What practical measures can they take, either directly through government action or indirectly through helping to stimulate and support action by industrial associations, cooperatives, private individuals, and firms?

To answer this question, we shall summarise briefly 14 types of action that have been demonstrated, by experience in other countries, to be useful ways of fostering modernisation and growth of small industry.

1) Creation of a favourable environment for industrial growth. The first essential is to establish the solid prospect of a growing market for industrial products. An overall development plan in which there is spelled out, for all to see, a firm programme of public investment and a set of well justified targets for expansion of the private sector of the economy helps greatly in this respect. It is sometimes maintained that a government development plan, including substantial public investment, will discourage private industrial initiative. While much depends on the orientation of the government programme and the way it is carried out, the effect on private enterprise certainly need not be adverse. On the contrary, one of the best ways to stimulate entrepreneurship is to present the enticement of a growing market.

An important way by which to promote a growing market for manufactures is to improve the productivity of agriculture. Agriculturalists are the great majority in newly industrialising countries, and as they

find themselves with more income to spend, the demand for manufactured goods and especially the opportunities for small, local enterprises will grow.

In a small country, particularly where the internal market for many manufactured goods will continue to be restricted for some time by low purchasing power, it is important to explore the export market. Opportunities for industrial growth may depend on international agreement to lessen trade restrictions and possibly to establish regional or other freer-trading areas within which a group of countries can mutually enlarge the market for their growing industries.

The second essential in creating a favourable environment is a legal framework and a governmental attitude which encourage men with entrepreneurial talent to go into industry and, though they may begin small, to expand their enterprises as experience and opportunities make this possible. A tax policy that favours the ploughing back of profits into further industrial growth is one important element.

The third essential is, of course, to make available electric power, transport facilities, water supply, basic health and education services, and other elements in the physical and social "infrastructure" which is so important to industrial growth.

Unless reasonable progress has been made or can soon be achieved in these three aspects of creating a favourable environment for industrial growth, it is hardly worthwhile to consider the more specific measures for fostering modern small industry.

2) Developing entrepreneur-managers. The key to widespread industrial growth, whether in a private-enterprise economy or one that depends more on publicly managed enterprises, is the rise of an energetic and skillful group of creative, innovating, achievement-motivated entrepreneur-managers. We are not too sure what, if anything, can be done to produce in a given society a larger supply of the achievement-motivated individuals who are likely to be successful entrepreneurs, though recent psychological studies have led to some interesting suggestions. However, we can give the promising entrepreneurial talent that does show itself more opportunity for business development and for self-development.

3) Industrial advisory services backed by research. Some of the principles and techniques that have made agricultural extension services valuable instruments of agricultural improvement are now being applied for small-industry development in a number of countries. A small-industry advisory service or industrial extension service should give counsel on two kinds of problems: a) technical production problems, such as plant lay-out and better use of machines and materials,



and b) problems of economics and business management, including the choice of promising lines of manufacture which an entrepreneur might enter, and techniques of marketing, costing, financing, and personnel management.

4) Industrial research services, linked to advisory services. It is a mistake to create an industrial advisory service without some provision, either within the service or through cooperation with another organisation, for industrial research activities to deal with knotty problems and to generate new ideas. Conversely, it is a mistake to create an industrial research establishment in the hope of aiding small industry, without at the same time providing an industrial extension service or some link with advisory and counselling services. These are needed to disseminate the results of research effectively and also to bring industry problems to the research organisation for solution.

Two kinds of applied industrial research are needed, corresponding to the two areas in which advisory services must give counsel:

- a) research on technical production problems;
- b) research on problems of economics and business management.

5) Small-industry financing, including "supervised credit." A key problem which must be faced in any small-industry programme oriented toward development -- that is, where the aim is to help existing small units to grow and new ones to start -- is that of more adequate access to capital and credit. The usual sources of funds for small, privately owned industrial ventures in newly industrialising countries, are personal savings of the proprietor and his family and borrowings from relatives and friends. Institutional financing of small industry is beset with difficulties in every country, because the cost of making many small loans is generally much greater than the cost of making one large loan, and because the risk on loans to small enterprises is substantial. The risk is heightened by the deficiencies of managerial skill and technical knowledge on the part of many small industrialists.

Many institutional devices have been tried or are being tried to cope with this problem, and some seem to have considerable merit. Generally speaking, the financial problems of small industrial enterprises are not purely financial. They are also symptoms of other problems -- poor planning, outmoded technology, ineffective marketing, bad product design, or lack of cost accounting. In such cases, no purely financial solution will really help.

In agriculture, similar situations arise in the financing of small farmers, and in response, a technique called "supervised credit" has been developed. This technique combines loans with advice, or even with training courses or other methods of adult education designed to



improve managerial competence. Such an approach has not been extensively or systematically applied in the financing of small industry. It would seem that an intimate combination of financing with technical and managerial counsel and other assistance deserves serious experimentation.

6) Common facilities. Common-facility service centres which are equipped to perform operations requiring costly, specialised equipment or special technical knowledge can be of great help to groups of small industrialists. Such centres also aid in spreading improved techniques, upgrading the quality of finished products, and maintaining standards of quality.

7) Industrial estates. An industrial estate is a tract of land which is subdivided and developed according to a comprehensive plan for the use of a community of industrial enterprises. The estate provides for installation of utilities and access to transportation. It may provide factory buildings or workshops for lease or sale. It may also furnish other facilities and services.

The industrial estate can aid small-industry development in several important ways. Small factories are often housed in cramped, dark, and dirty quarters which are not conducive to good work by human beings or by machines. Improved premises can stimulate workers and management to other improvements. The industrial estate relieves the small industrialist of the oftentimes arduous task of getting title to land, having a building constructed, arranging for electricity connections, and the like. These advantages may also be factors in attracting foreign investment. The provision of suitable factory premises on a rental basis or on hire-purchase helps to meet the financial problems of promising small industrial enterprises. It is as good as a loan, if otherwise the enterprise would have to finance its own building. The risk of loss is comparatively small, because the premises can be rented to some other firm if the first one fails. If the government deliberately wishes to subsidise industrial development in a particular place, it can do so by offering rentals on an industrial estate at less than full cost.

An industrial estate can be used as the focal point for a wide range of other activities to assist small-industry development. It provides an excellent location for representatives of advisory and information services, and for research services, financing services, training programmes, and common facilities useful to a group of industrial establishments.

Finally, industrial estates can serve as an important tool of city planning and the control of urban growth.

8) Marketing aids. The small industrialist, especially if he enters manufacturing from the craftsman or engineering side, oftentimes fails to do an adequate job of marketing. He can be helped in a number of ways. One of the most important aids is marketing information, based on economic investigations and field surveys which small firms are not in a position to undertake for themselves. Special marketing organisations are sometimes helpful in order to pool the marketing needs and expenses of a group of small establishments -- for example through a marketing cooperative. Trade fairs can be held, and assistance can be provided in making exports contacts. In addition, the next three methods to be considered (contracts and assistance by large firms, government purchases, and quality control systems) help the small industrialist with his marketing problems.

9) Contracts and assistance by large firms. As we have seen, the relationship of large industry to small is not necessarily one of elimination of the small firm by the large firm, or even of domination. There are possibilities of interdependence and mutual benefit. In fact, one of the best means of encouraging small industry in a locality which has industrial potentialities but is not far along in developing them may be to induce one or several large plants to locate there and to cooperate in fostering diversified industrial growth around the nucleus thus created.

10) Government purchases. In some countries, an organised effort is made by the government to channel a part of the government's own purchases to smaller manufacturers.

11) Quality control systems. A number of governments, oftentimes in cooperation with industrial associations, have found it useful to establish quality control and quality marketing schemes. This is especially important in cultivation of the export market.

12) Facilitating procurement of materials and equipment. The small manufacturer often suffers handicaps in purchasing as well as marketing. It may be worthwhile to encourage bulk purchasing arrangements for groups of small enterprises, through purchasing cooperatives. In some countries, the shortage of certain materials or a shortage of foreign exchange for the purchase of imported equipment and materials leads to a system of licensing which requires much paper work and red tape. The small manufacturer is likely to be handicapped by these requirements even more than the large one, for he cannot afford to maintain a specialised staff to fill out forms and learn the procedures of control agencies. Therefore, a small-industry development programme in some countries may need to include simplified procedures for use by smaller establishments in requesting materials or equipment allocation. Or it may even be desirable to import widely needed items in bulk for distribution to smaller users through an association, a cooperative, or a government agency.

13) Consolidation, cooperatives. Developers of small industry should face the fact that some small units are just too small to be efficient. Consolidation of separate enterprises and the pooling of efforts of individual craftsmen ought to be encouraged in some cases. There are several ways of achieving consolidation.

One is through the growth of better managed and more successful firms; the less successful firms go out of business or are merged with expanding firms.

Another is through the formation of industrial cooperatives, of which there are two major types. The first is the producers' cooperative or workers' cooperative in which the workers own the enterprise, elect the board of management, and share the earnings. The record of this type of cooperative seems to be a very spotty one. The main problem is the quality of management. The second is the industrial service cooperative in which independent small entrepreneurs band together for joint selling or for providing themselves with some other common service.

14) Mutual self-help through industrial associations. Governments are learning that often it is more economical to assist privately organised agencies than to provide direct aid to entrepreneurs. In some countries, such as the northern countries of Europe, trade associations or associations of small industrialists have proved themselves capable of carrying on training services, advisory services, research services, and financial services for their members -- often with the aid of government subsidies.

### Designing a Small-Industry Programme

Suppose, now, that the responsible officials of a country in course of development want to initiate a programme to encourage modernisation and growth of small industry, or perhaps to supplement and integrate a number of more or less uncoordinated measures already under way so as to achieve a revitalised small-industry programme. What specific steps might be taken to get the programme going?

First, suggestive ideas from many countries should be considered.

Second, responsibility for developing and coordinating the small-industry programme should be placed in one administrative agency, whose head should be granted the authority and budget to enable him to elicit the cooperation of other organisations.

Third, the small-industry development programme should be reasonably comprehensive. Usually it does little good merely to set up an institution charged with making capital and credit more readily available

to small industry. The developmental results are likely to be disappointingly small, because opportunities for making truly sound developmental loans to small industrialists will be limited by such factors as lack of technical knowledge, poor marketing, badly designed products, and lack of skill in planning and managing the expansion of a business. Similarly, a technical advisory service by itself -- or an industrial research institution, or a demonstration centre showing improved practices, or a management training course -- will have a rather limited effect if set up in isolation rather than as part of a more comprehensive programme. Usually the limiting factors so revealed will be multiple, and the action programme will need to be a broad, integrated one, so that each kind of assistance reinforces the other kinds and is reinforced by them.

## PUBLIC POLICIES TO ENCOURAGE SMALL INDUSTRY IN ASIA

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This is a  
summary  
of a part  
of the  
paper.

The main development problem of smaller manufacturing enterprises is the inability of the master craftsman and the small entrepreneur to cope single-handedly with the technical, economic, social, and organisational problems of modernisation. The master craftsman, and even the small-plant owner, is unable to do all the varied tasks for the successful operation of any enterprise, whether large or small. He may be an accomplished technician, but his products still may not meet market requirements. He may have commercial talent but still fail to organise technical production in an efficient manner. The small entrepreneur has little opportunity to keep abreast of modern developments in manufacturing processes, consumer preferences, marketing, or enterprise organisation. Neither can he, unaided, avail himself of economies of scale in raw materials, credit, or marketing.

Experience with government action to encourage small industries has demonstrated that piecemeal introduction of assistance programs does not yield results which are even remotely commensurate with efforts made and money spent. A more coordinated approach is needed.



### Small-Industry Development Organisations

A number of Asian countries have developed institutions to encourage small-scale and handicraft industries. We can cite the Japanese Smaller Enterprise Agency; the Indian Central Small Industry Organisation; the Khadi and Village Industries Commission; the All-India Handicraft, Handloom, Coir and Silk Boards; the West Pakistan Industrial Development Corporation; the East Pakistan Small Industries Corporation; the Taiwan Handicraft Promotion Centre; the China Trade and Productivity Centre; the Malaysian Rural and Industrial Development Authority; and the Small Industries Service Institute of Ceylon.

International agencies have been cooperating in strengthening these activities. The International Labour Organisation (ILO) and the United Nations Special Fund have worked with the Government of Singapore to establish a Light Industries Service Unit to help artisan shops and small factories meet their day-to-day problems of modernisation. An ILO expert has helped Thailand develop a Small Industries Service Institute, a credit scheme for small industries, an industrial-estate programme, and a marketing organisation. International agencies are working with the Government in Taiwan to establish a Metal Industries Development Centre to work primarily with smaller engineering industries and with the Philippine Government to expand its services to both traditional and modern small industry, especially in rural areas. ILO has cooperated with Korea to establish a number of coordinated programmes to promote smaller manufacturing. Among these are cooperatives, loans, and services to promote productivity and an advisory field service.

### Problem Areas in Small-Industry Development Programmes

To undertake a programme to encourage small-scale industries, detailed plans must be laid to establish an efficient extension service, probably using trade associations as a main vehicle. To increase credit, not only special loan schemes but, even more importantly, public policies to extend the national banking system to the small-industry sector are needed. It is essential to include the needs of smaller units in the work program of national technological research and testing laboratories. So far, these have almost exclusively confined themselves to the needs of larger manufacturing enterprises, particularly those in the public sector. Small industries can make a substantial contribution to developing indigenous technologies more suitable to an abundance of low-skilled labour and a paucity of capital.

Policies are still to be developed in most countries to promote systematic cooperation between smaller and larger manufacturing units. Special attention is needed to assure that small industries are not neglected in government purchasing, supply of controlled materials, foreign exchange, and industrial sites. Industrial and social policies



need to be coordinated to ensure that labourers working in small industries benefit from the system of social services.

### Staff Training For Small-Industry Programmes

Most countries lack qualified staff for small-scale industry programmes. This is particularly acute for extension services, which are the "cutting edge" of promotional tools. The pattern in Asia has been for extension agencies at first to concentrate on raising technological levels in order to encourage productivity gains from improved techniques, equipment, and processes. Soon, however, a need appears to help small industries apply better management. For both activities, training and retraining programmes for extension personnel must be designed to keep their skills up to date and in line with the changing needs. Unfortunately, few systematic in-service schemes exist in Asia. Staff training is largely confined to fellowships for training abroad.

There are several special, foreign training courses for extension personnel. A bi-annual course at the Research Institute for Management Science in Delft, The Netherlands, trains extension personnel and small-plant managers for a six-month period. Both a general programme of instruction and individual programmes of work in particular industries are included. The Asian Productivity Organisation in Tokyo has a six-month, small-business, management training course to develop trainers and consultants for small enterprises. (A comparable course at the Stanford Research Institute in California has since been discontinued.)

Training abroad, however, cannot replace basic training of staff in their own country. To meet this need, India has established the Small Industry Extension Training Institute to offer 12-week courses for small-industry officers on "area development" and "industrial management." Practical work in industry is sandwiched between classes. More recently, the Philippines has established a systematic training scheme for small-industry extension staff.

### Development of Indigenous Entrepreneurship

There is room for considerably more activity in identifying and enlarging the entrepreneurial resource base of small industries. Research is needed into the background, motivation, and aspirations of small, independent industrialists. An effort is needed to locate and encourage entrepreneurs and to direct their efforts to activities according to national industrial priorities. While technology and capital can be imported from industrialised countries, only indigenous talent can provide the entrepreneurial force for a small-industry programme.

In developing countries, the traditional role of independent businessmen as innovators of new products, processes, organisation, markets, and supply sources is narrowed and simplified. "Late arrivals... have the advantage of building on borrowed technology, techniques of production, and even product lines," M. C. Stelly has pointed out. (*International Development Review*, June 1964.) What is needed is a "humbler type" of entrepreneur who exploits possibilities within a limited time horizon and on a small scale.

The UNESCO Research Centre on Social and Economic Development in Southern Asia in New Delhi has undertaken research on the influence of class, caste, education, and previous occupation on entrepreneurial initiative. It is studying family conditions among small employers and their workers. The findings from these studies, undertaken in India, the Philippines, and elsewhere, and of similar studies undertaken by private researchers are providing a better understanding of growth conditions in small industry. They indicate fruitful extension approaches.

India is carrying on an interesting experiment to encourage potential entrepreneurs. In a number of predominantly agricultural districts, industrial-potential surveys have been carried out. These are followed by meetings with prominent local leaders of agriculture, trading, and handicrafts. These men are told of the special services available to them. Practical demonstrations are given in mobile vans carrying power machinery for carpentry, leather work, food processing, and other activities suitable for small-scale industries in areas lacking most of the supporting facilities required by more complex modern industry. "Model schemes," giving data on capital, equipment and processes, labour needs, skill levels, output, and expected profit levels are offered for sale. Technical specialists offer expert advice on establishing new manufacturing units. Hire-purchase facilities are offered. This dynamic attempt to spread the idea of industrialisation has so far yielded most encouraging results. In the few districts where the intensive area experiment has been completed, hundreds of new entrepreneurs have come forward.

## ACHIEVEMENT MOTIVATION CAN BE DEVELOPED

David C. McClelland

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These are  
excerpts  
from the  
article.

Granted that the need for achievement runs weaker among some people than others, can anything be done about it? Where motivation is weak, can it be made stronger? On the basis of evidence recently acquired, I believe the answer in each case is yes. I shall discuss this evidence and its implications in this article.

### Motivation Essential

As past research has made clear, the person with a high need for achievement is more self-confident, enjoys taking carefully calculated risks, researches his environment actively, and is very much interested in concrete measures of how well he is doing. He does not seem to be galvanized into activity by the prospect of profit; it is people with low achievement need who require money incentives to make them work harder. The person with a high need works hard anyway, provided there is an opportunity of achieving something. He is interested in money rewards or profits primarily because of the feedback they give him as to how well he is doing. Money is not the incentive to effort, but rather the measure of its success for the real entrepreneur.

David C. McClelland is Professor  
of Psychology at Harvard University,  
Cambridge (Mass.).

Such a finding does raise some interesting questions about what might be called the classical approach to stimulating enterprise or economic growth in underdeveloped countries. Most policy makers have taken the view that what should be manipulated in such places is the environment -- or, more specifically, the opportunities to make money. They have felt it safe to assume that, on the average, an increase in opportunities will evoke an increased response from potential entrepreneurs who will come forward to take advantage of the openings, just as more investors will come forward if interest rates go up.

Like most assumptions, however, this one holds true only under certain conditions. Above all, it holds only if there is a certain minimum level of achievement need present in the group of people affected. As an illustration, let us take a recent study by H. L. Sheppard. He surveyed the attitudes, actions, and achievement needs of a fairly large sample of unemployed blue-collar workers in Erie, Pennsylvania. He wanted to find out what they did when they were laid off, what they believed about their situation, and how long it took them to find a job. What is of particular interest here is how the small number of men with high achievement needs behaved as compared with those who had low needs.

The "highs" were much more active in looking for a job. They started looking sooner -- practically the day they were laid off rather than a week later after having rested up a little, as in the case of the "lows." They checked more companies; they were more apt to go out of town to look for work; they looked more often for a really different job. Not surprisingly, they found a job sooner than those with low achievement needs.

The picture one gets of the "lows" is that many of them spent their time at home living on unemployment insurance, waiting for their old company to rehire them, or for the U. S. Employment Service to turn up a job just like the one they had held, which they could accept with the minimum adjustment in skills or living conditions. In fact, many of them said they would not under any circumstances take a job that meant moving away to another community.

The situation in Erie is analogous to the problem found in the business sphere in many underdeveloped countries: opportunities for business, which men with much initiative would find, are not exploited by local potential businessmen because they have low needs for achievement.

It is not enough to change the environment alone. The response of people to such changes is not quick or automatic. But suppose the achievement motive is an acquired characteristic which can be developed by certain special training techniques, just the way a language

skill can be acquired in adulthood. If so, the policy consequences would be very great. A way would be opened to making poor people more active in finding and seizing opportunities available to them.

We decided several years ago to go ahead and try to develop the achievement motive in adults. We knew exactly what it was that we wanted to change -- the measurable need for achievement we called n Ach -- and we knew a great deal about the particular beliefs and action it led to.

### A United States Experiment

Our initial idea was simply to take whatever we had learned about the achievement motive and teach it to a group of executives who had reason to want to improve their performance as entrepreneurs. Our pilot experiment was with a large U.S. corporation which sponsored a number of training courses for its executives and was willing to let us try our course as an experimental variation in its regular educational program.

The participants were carefully matched with other executives from the company who had attended one of the regular executive development courses given by the company. We did a careful follow-up study two years later to find out which group of men had done better in the company subsequent to training. The participants in our course had clearly done better on the average -- been promoted faster -- than their matched controls.

In part, this appeared to be due to the fact that those men who had attended the regular company course had slowed down somewhat; that is, they were advancing somewhat less rapidly after the course than they had before, whereas our participants had continued to forge ahead. So far as we could tell, the reason the regular group slowed down was that the company course had stressed the importance of "not rocking the boat," of representing the company image as it was outlined for them in the course.

### The Kakinada Program

Would our program work in an underdeveloped country? To answer this question we turned to India, where we were able to give a fairly extensive field test to our training methods, thanks to the cooperation and help of a number of institutions, chief among which were the Carnegie Corporation and the Small Industries Extension Training (SIET) Institute, a Government of India society located in Hyderabad and initially financed in part by a grant from the Ford Foundation.



We decided to try to push a whole community into an economic "take-off" by training a significant number of its business leaders in achievement motivation.

After a careful study, a number of small cities were identified throughout India which were economically comparable -- that is, they were of about the same size (100,000 inhabitants), with comparable percentages of people who were literate, working in industry, and so forth, and with similar rates of development over the past ten years. Our research plan was to put concentrated motivational training programs in several of these cities, observe the effects of business activities and economic indicators over a number of years, and compare these results with those in cities where businessmen had not been trained.

Kakinada, a port city in Andhra Pradesh on the Bay of Bengal, was chosen for the first series of courses. In four batches of 12 to 15 members each, 52 men from Kakinada traveled 350 miles to Hyderabad during 1964 to participate in a 10-day residential course at SIET Institute. They were, for the most part, heads of small businesses -- bicycle shops, retail stores, small foundries, and fiber exporting -- but the groups included also some lawyers, bankers, and politicians.

### Training Methods

I shall only outline three main techniques employed in the Hyderabad program.

1) Goal setting. The very fact that the men from Kakinada voluntarily decided to take time off to go some distance to attend the course at some expense to themselves signified that they had, to some degree, accepted the notion which was the basic goal of the course -- namely, that they could change, that certain prestigious institutions (Harvard University, the SIET Institute) might have come up with a new technique which would make them better businessmen.

Extensive research on attitude change, psychotherapy, and other types of psychological influence points to the great importance of such "prestige suggestion" -- creating a strong belief that one can and should change. Starting from the belief in the general possibility of change, a course like that in Hyderabad arranges for the individual to focus on his specific personal plans for change in the next two years. Late in the course he writes out a document describing his specific goals, how he plans to achieve them, what personal or other difficulties he is likely to encounter, how he will feel under various conditions, and so on.

In short, the participant learns to use the language of achievement so that it colors his experience in everyday life. He further learns to



distinguish achievement goals from other strivings that activate men which may masquerade as achievement but actually interfere with it -- such as the lust for power and the need to maintain social prestige at all costs.

2) Cognitive supports. If one conceives of what we are doing as an attempt to introduce a new associative network into the everyday thinking of the course participants, it is obvious that what is new must somehow come to terms with what is already there. Chief among these are one's network of assumptions about: a) what is reasonable, logical, and scientific; b) what kind of person he thinks he is (his self-image); and c) what is important and valuable in life.

To satisfy the demands of the "what is reasonable" network, the whole scientific basis for believing the achievement motive to be important for entrepreneurial success is presented, including data from many experiments.

Then there is the question of self-concept. A man may well ask: "Am I a person with a high achievement motive? If not, do I want to be? Do I have other characteristics which make it difficult for me to behave as if achievement is what really counts? What kind of a person am I?" Group and individual sessions are run in which the person tries to get an honest picture of himself, his desires, and what he might reasonably expect to become. In this process, his own psychological test data are fed back to him.

In addition, some of the often unconscious value assumptions of the culture need to be discussed. For example, in India there are several traditional assumptions that typically interfere with achievement: the stress the Gita and much traditional Hindu thought places on noninvolvement in this world so that too much concern with achievement means one is both selfish and bound to make himself unhappy; the extent to which the interests of various communities are seen as separate and conflicting so that disputes and factions arise, the tendency to exalt mind and spirit over matter to the point that realistic goals may not be set; and others. These value assumptions need to be worked through to make sure that the new achievement-oriented outlook is not endlessly sabotaged and undercut by older, well-established, associative networks.

3) Group supports. The would-be achiever needs to feel emotionally supported as well as rationally supported in his attempts at self-change. Emotional support is given by the instructors who maintain throughout an accepting, nonmanipulative attitude. The message they attempt to convey by thought, word, and deed is: "Whoever you are, we accept you as worthy of our respect. Whatever you decide you want to be, we will respect your choice -- including the possibility that you may decide the achievement motive is not for you." (In fact, several participants in the Indian programs have decided it was "not for them.")

Another source of emotional support is the experience of group living -- of being involved in a rather disturbing but exciting new experience together with other potential leaders. In the case of Kakinada, the participants decided to maintain their newfound solidarity by creating the Kakinada Entrepreneurs' Association, which is designed to keep their interest in community and self-development alive.

## Results

What are the effects of the Hyderabad course? It is too soon to know what the long-range results will be, but between six and ten months after training, two-thirds of the men had become unusually active in business in some readily observable way; e.g., they had started a new business, expanded their old business, greatly increased profits, or taken active steps to investigate a new product line. Only one-third of these men had been unusually active in similar ways in the two years prior to taking the course. In short, the course would appear to have doubled the natural rate of unusual entrepreneurial activity in this group.

What are some concrete examples of actions taken that such statistics summarize? The following are representative:

One man who owned a small radio shop decided to start a paint and varnish factory. It has succeeded, and he has opened another radio shop.

A banker decided that he had been too conservative in making commercial loans because typically he had been concerned only about the security for the loan. In effect, this meant that only the wealthy land-owners could get loans by putting up land as security, and by and large they did not need loans except for occasional heavy expenditures for weddings and other such ceremonial events.

The banker decided that, in addition to security, he should take into account the quality of the project and the quality of the man asking for the loan -- two obvious criteria, perhaps, but not much used at that time in Kakinada. As a result, his banking business began to flourish -- so much so that his superiors offered him better jobs elsewhere. His loans have already begun to bear fruit for Kakinada in the form of new enterprises started and of a new spirit in the banking business there.

Many other men have taken small concrete steps to improve their businesses.

One has decided to go to work daily instead of leaving his shop to his assistant.

A photographer has ordered a lens-grinding machine so that spectacles can be ground locally.

One man is arranging to make bicycle stands locally.

A palmyra fiber exporter is seeking the know-how that will enable him to process his raw material into a finished state locally so that he need not sell it so cheaply to the Japanese for processing.

A wealthy family has started a new sugar mill.

The examples could be multiplied many times over. Whether, in the long run, all this activity will lead to a significant "growth spurt" for Kakinada as compared with other similar cities remains to be seen. All one can say now is that many more of the businessmen of Kakinada are doing the things that should lead to such a spurt.

### A Program in Bombay

What about salaried executives? Does achievement training affect them as it does small business owners and professional men? We have run another pilot experiment in Bombay that helps to answer the question. There, 32 salaried executives from a variety of small and large firms took achievement training in 1963. Two years later a follow-up revealed that, once again, two-thirds of the men had become unusually active, as compared with 20 to 30 percent who were quite active before the course. Here the sign of unusual activity shifted from "new business starts" or innovative activities to unusual salary raises, for the most part.

One alumnus of this program has been extraordinarily successful. Previously he had been for many years a salaried executive for a large oil company in charge of employee relations for all of India. As he had enough money to live comfortably, he had been thinking of retiring at 47 and moving to England where his son lived. After the training, instead of moving, he decided to resign his job, take his savings, and risk them in the construction business in India.

Because of his excellent standing in the business community, he was able to raise over a million dollars in a few months to put up the tallest building in Bombay. He is an active, interested, and successful large-scale entrepreneur, already started on his second building. He has put what the banker from Kakinada calls "dead money" to work, supplying a great demand for housing and creating employment for hundreds of workers.

Could it be that we were getting increased rates of entrepreneurial activity after the courses in Bombay because general business conditions in India between 1963 and 1965 were better than they had been in 1961 through 1963? In 1965, we followed up on a number of businessmen who had applied to take achievement motivation training in Bombay

in 1963 but who had not taken the program because there wasn't room. The percentage of them who were unusually active by our criteria was roughly the same in the 1963-1965 period as in the 1961-1963 period -- around 20 to 30 percent -- just what it had been for our course participants before their achievement training. Our conclusion, therefore, is that an improvement in general business opportunities in 1963-1965 was not responsible for the increased activity of the men who had been specially trained by us.

### Influence of Climate

Achievement motivation training must, of course, take place in a certain psychological or social climate -- whether it be national or local. We believe that such climatic factors are of tremendous importance, but we have only begun to investigate them. It is widely believed that the general climate of confidence in the American business community has a tremendous impact on the decisions of individual businessmen to expand or contract. In India at present, the climate of opinion is not particularly confident; there is not a widespread feeling that the country is expanding. Newspapers and public speeches do not yield much that indicates the existence of a strong climate of achievement.

Will the climate of doubt and pessimism in Kakinada override the generally increased level of achievement needs among local businessmen and discourage them in the long run? We tried to create a climate of community confidence by putting a significant number of them through the training courses, but even this may not be sufficient to withstand the national climate of doubt and discouragement.

### Tentative Conclusions

It is often not enough to change opportunities for development in less developed countries. There are plenty of opportunities around, but they are not exploited because of low achievement motives. It is necessary to move in and increase needs for achievement. Preliminary studies strongly suggest that this can be done and done fairly economically -- not with long-term, expensive educational programs taking months or years, but in short, intensive courses lasting ten days to two weeks, under optimal conditions.

It also seems clear that large sums of money can be wasted trying to retrain unskilled workers and give them more opportunities if, at the same time, motivation training is not undertaken, so that the individuals will want to use their new opportunities or new skills.

Enough people are intrigued by the possibilities of this approach to have created a demand for an organization which can supply, on a

regular basis, the kind of motivation training with which we have been experimenting in India. The Human Resources Development Corporation in Cambridge, Massachusetts, was created for this purpose. However, research on the achievement motive must and will continue. Our present knowledge is useful, but very crude from the theoretical point of view. We must discover far more precisely how to influence motivation and use that knowledge for human betterment.

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GETTING AGRICULTURE MOVING;  
THREE BOOKS

Mosher, Arthur T., Getting Agriculture Moving, New York, Praeger, 1966, US\$ 6.00 (clothbound), 2.50 (paperback), 192 pp. Readers in Asia, Latin America, and Africa may obtain single copies free upon request to The Agricultural Development Council, 630 Fifth Avenue, New York (N. Y.) 10020.

Schultz, Theodore W., Economic Crisis in World Agriculture, Ann Arbor (Mich.), University of Michigan, 1965, US\$ 3.50, 114 pp.

Dumont, René, False Start in Africa, New York, Praeger, 1966, US\$ 7.00, 320 pp.

All three of these books deal with problems of modernizing agriculture. Most of what they contain is probably already known by agricultural development specialists in close touch with farmers, but all three have the substantial virtue of organizing this information cogently and comprehensively. It is also true, unfortunately, that many administrators and academics who have a hand in agricultural development are not specialists and do not understand farmers. For both kinds of people, these books provide a view of the essential context within which agricultural modernization must be seen. They generally agree in their picture of agriculture; all concentrate on the farmer, the forgotten man who is the key to development.

Getting Agriculture Moving is "an overall review of the bare minimum that every technician, field worker, administrator, planner, and legislator needs to know about the total process of agricultural development," of what is "already common knowledge." This book is written in deceptively simple English, and those who feel that complex ideas can only come

wrapped in complex words may think it is insultingly simple. The book can be read quickly -- a great asset as any busy administrator knows -- and provides an excellent overall framework for thinking about agricultural development. A companion training manual, soon to be published, is to contain teaching aids and reading lists for each topic.

Mosher, the Director of The Agricultural Development Council in New York, feels that farmers are as rational as other people, and that farming is best considered as a business and not as a way of life. He stresses the importance of security of tenure as an incentive to farmers to invest in their business by improving land and production facilities.

The author distinguishes five essentials for development: markets, constantly changing technology, local availability of supplies and equipment, production incentives for farmers, and transportation. Marketing includes necessary transportation, storage, and processing. The farmer's confidence in market institutions is of extreme importance. Technological changes may occur by importing techniques, by learning from neighbors, or by the farmer's own experimentation, but local adaptive research is most important. Both production incentives and supply availability hinge on the dependability of supply and demand, and on the relationship of input and consumers' goods prices to sale prices for farm outputs.

Without the five essentials, agricultural development cannot take place. Beyond these, five accelerators are distinguished: education, credit, group action, improving and expanding agricultural land, and national planning. Education must be for all ages; it must bear in mind the farmer's interests and needs, cater to his work schedule, and provide opportunities for him to practice what he learns. Furthermore, city dwellers, who wield a disproportionate amount of political power, must be taught to understand farming. Group action includes community work projects, cooperatives, and local government, all of which can have significant impact on development. National planners of agriculture should realize what can be done by government and what can only be done by farmers. It should take account of different regional agricultural conditions and should integrate industrial and agricultural planning. Getting agriculture moving is a complex task which requires simultaneous considerations of all aspects of this framework.

The book ends by insisting that each reader ask himself what he can do for agricultural development. The last page, mostly blank, begins, "I can ...."

In his latest book, Schultz, of The University of Chicago, gives a brief and particularly cogent presentation of arguments he has presented in Transforming Traditional Agriculture (New Haven, Yale,

1964) and elsewhere. Traditional farmers are not lazy; they use production possibilities available to them optimally; there is no significant rural underemployment. Economists should take people's preferences for granted and, when they try to deal with sociological factors, they usually go astray.

Having emphasized farmers' economic rationality, Schultz argues that lack of regular supply of modern inputs at prices which make their adoption profitable is the primary obstacle to modernization. "We need to detect and help correct the widespread underpricing of farm products and overpricing of agricultural inputs in poor countries." This correction, plus extension work, local research (which pays off slowly but very well), and improved distribution by public and private entities, is expected to produce success.

Economic Crises in World Agriculture was originally delivered as four lectures for an American audience. A section is devoted to American agricultural problems, and much attention is paid to successes and failures of the American agricultural aid program and to what Americans can do to help. The book is exhortative, but documentation for the arguments may be found in Schultz's other writings. If he pictures the farmer so that he appears more rational than other men, it is only to counteract those who have maintained that he is much less so.

Dumont is Director of the Institut National Agronomique in Paris. This book is the English translation of L'Afrique noire est mal partie which created a furor when it appeared in 1962. Dumont is famous for his acerbic analyses of agricultural development in Asia, the Soviet Union, and elsewhere, and of the damaging effects of the colonial heritage. Here he is particularly critical of the bureaucracy in ex-French Africa, where a civil servant may earn as much in one and a half months as a farmer does in his lifetime, and of foreign-controlled trading monopolies there.

As a result of the author's specialization and the nature of the countries with which he is concerned, much of the book is devoted to agricultural modernization. Dumont might not agree with Mosher and Schultz on the advantages of freehold tenure or even private commercial supply firms, but one of the interesting aspects of his analysis is how much his other emphases coincide with theirs, despite a background of considerably different economic philosophy. He stresses the need to think of the farmer, to develop food production, abandon prestige projects and tractor farming for improvements using local resources, to improve the availability and dependability of input suppliers and marketers (mostly through cooperatives), and, above all, radically to reform education to serve the needs of the farmer.

Each of these books reflects the growing attention being paid by specialists to the farmer himself as the key person in agricultural modernization. Each reflects a turning away from emphasis on rural institutions alone. Each stresses the key role of economic incentive. These attitudes stem, in part, from growing evidence that the traditional farmer acts rationally within his framework in responding both to price incentive [ see Development Digest, Vol. III, No. 2, July 1965] and to wage incentive [ see the disguised unemployment section in this issue].

